THE IRON TRADE REVIEW

Volume XLVI CLEVELAND, MARCH 24, 1910 Number 12

MODERATE PRICES

WILL PROBABLY CHARACTERIZE THE YEAR.

Increase in Buying Brings Lower Quotations — Fair Sales of Pig Iron—Some Railroad Orders.

As business shows a tendency to increase in volume, it is almost invariably at the expense of prices, and present indications are strongly against the prevalence of high quotations as a rule throughout the year. Expectations of a boom year are being dismissed, but it is generally believed that we shall witness a period of sound prosperity. The outlook is that the United States Steel Corporation will make a new record this month in finished output.

Iron Ore Rejected

Owing to dissatisfaction with the results obtained in the blast furnace, one contract for 30,000 tons of foreign ore has been cancelled, and other cancellations are probable. This may cause an increased demand for Lake Superior ores on the part of eastern furnace interests, which are still indifferent about placing orders.

Pig Iron Conditions

Following heavy purchases by the leading radiator company, the leading pipe company has purchased a round tonnage, the amount being variously stated, and there is considerable quiet negotiating. The American Radiator Co. is in the market for from 5,000 to 10,000 tons of southern iron, and the American Car & Foundry Co., 10,000 tons of malleable and 5,000 tons of foundry. The Beaver Dam Malleable Iron Co., Beaver Dam, Wis., has purchased 12,000 tons of malleable from Milwaukee and Chicago furnaces. A car wheel company at St. Louis has purchased from 10,000 to 12,000 tons of various grades of pig iron, and a Connecticut hardware manufacturing concern has bought from 6,000 to 8,000 tons of No. 2 and No. 3 foundry from New York furnaces. A sale of 5,000 tons of southern basic has been made at Cincinnati. The basic market in the east is weaker, owing to reports that the iron can be purchased at less than $16, valley. Sales of limited tonnages have, however, been made at $16, valley furnace. Inquiries for a large tonnage of iron by pipe interests are still pending in the east.

Railroad Buying

The Chesapeake & Ohio has ordered 3,000 cars, the Pressed Steel Car Co., the American Car & Foundry Co., and the Standard Steel Car Co. each getting 1,000. The order of the Southern Railroad is now reported at 3,600 cars, of which number 2,000 will be built by the Western Steel Car & Foundry Co. The New Haven railroad has ordered 9,000 tons of open-hearth rails from the Maryland Steel Co., and 4,500 tons from the Bethlehem Steel Co. The Boston Elevated has purchased 1,500 tons of rails from the Pennsylvania Steel Co., and 1,000 tons are reported to have been awarded to another Pennsylvania interest. The Chicago office of an eastern company has taken orders for 4,500 tons for street railways. The Delaware, Lackawanna & Western is in the market for 500,000 tie plates.

Structural Material

The demand for structural material has not developed as rapidly as was anticipated this month, and in some sections there is considerable hesitation in making contracts. The Wisconsin Bridge & Iron Co. has taken an order for 2,000 tons for the Great Northern, and 1,700 tons for the Omaha & Council Bluffs railway. The Bankers' Hotel, Oakland, Cal., 2,000 tons, was awarded to Milliken Bros. The Eighteenth street viaduct, St. Louis, 800 tons, went to the Missouri Bridge & Iron Co. There is some shading of quotations on structural material, especially by eastern Pennsylvania mills for eastern shipment.

Finished Materials

Manufacturers of nuts and bolts have re-affirmed their prices and report that conditions are very satisfactory. The lock bar pipe for the Portland, Ore., water works system will be furnished by the J. A. Gillespie Co., Pittsburg. The city of New York has divided among a number of concerns a contract for 6,000 tons of cast iron pipe. Atlanta, Ga., has awarded 4,000 tons to the leading interest. The steel bar market is active, and deliveries are long delayed, extending in some instances seven months. A few implement companies have made contracts for steel bars for the year ending July 1, 1911, but some sellers are declining to make contracts so far ahead. The pressure for bars is tremendous and there is likely to be a shortage. Some very low prices are being made on coke. The demand for bar iron is only moderate. The iron mills, upon getting out of their immediate territory, find it necessary to shade quotations sharply in order to meet competition.

PIPE COMPANY BUYS.

Cincinnati, March 23.

A round tonnage of southern No. 3 or 4 and gray forge iron has been purchased by the leading pipe interest. One report is that 26,000 tons were purchased for western plants. In this city it is stated that the tonnage was not so large.

A sale of 5,000 tons of southern basic has been made, but details as to price and purchaser are not made public. The price of the pipe iron is also uncertain. The Detroit Stove Works has purchased 7,000 or 8,000 tons. There is considerable business going without general inquiry. The impression is that prices will stiffen.

THE WEEK IN IRON CENTERS

PITTSBURG.

Heavy Inquiries Pending—Some Price Concessions.

Office of THE IRON TRADE REVIEW,
510 Park Building, Mar. 22.

Although there is perhaps less activity in some lines of the iron and steel trade this week as far as actual bookings are concerned, genuine inquiries involving heavy tonnage of finished material for second and third quarter delivery are noted and there is an undertone of strength and promise of greater activity in all branches in the next 30 days. Makers generally are satisfied with the showing made during the first three months of the year and feel confident that this record will be exceeded during the second quarter.

Shading of current market quotations in two or three lines is noted. This is thought to be due to the fact that in a few lines the first real tonnage for the second quarter is coming out and some makers appear to be willing to take this business at slightly lower prices in order to insure steady operation of their plants to capacity up to July 1. So far price concessions have had no serious effect upon market conditions and likely will not have, as there appears to be plenty of business in sight. Prices of line pipe consigned to the California territory are being cut upwards of $2 a ton. Makers of pipe have unusually large stocks on hand.

The American Sheet & Tin Plate Co. has started two more hot tin mills at the Shenango plant this week and is now operating 191 out of an entire serviceable capacity of 235 hot tin mills. Demand for sheets and tin plate is exceedingly heavy. More activity is noted in the semi-finished market. A large volume of tonnage in steel bars is coming out and makers are accepting little tonnage at the lower quotations. The bar iron market is less active. Considerable new business in structural lines is appearing. Although far from satisfactory, the rail market shows improvement this week and the output for March will exceed the February record. Specifications and new tonnage in plates are heavier than a week ago.

The local pig iron market is quiet, although investigation shows that demand for Bessemer, basic and foundry pig iron for second quarter will be heavy. The coke market continues weak owing to the unsettled conditions surrounding the mining industry. Some improvement is noted in the old material market and brokers say an advance in prices is not unlikely.

Pig Iron.—Investigation shows that pig iron requirements during the second quarter will involve heavy tonnage of Bessemer, basic and foundry grades. Several weeks ago it was believed that most consumers had been fairly well covered for their requirement up to July 1, but recent developments show that a number of large consumers will be obliged to enter the market shortly.

It is estimated that inquiries are now pending in this district for approximately 10,000 tons of Bessemer iron for second and third quarter delivery. This tonnage is involved in three or four inquiries that have developed this week. During the last ten days, the local Bessemer market has been exceedingly quiet as far as new buying is concerned. While the $18, valley, quotation possibly could be shaded for prompt delivery iron, this appears to represent the general market level. Furnace interests believe that inquiries from several local steel companies for second quarter delivery will come out shortly.

A sale of 1,000 tons of basic for second quarter delivery at $16, valley, is noted, and several inquiries, which, in the aggregate, involve fairly heavy tonnage, are pending. Practically all of the speculative basic iron has been disposed of, and, aside from a few small lots, it is doubtful whether this grade could be bought much below the $16, valley, quotation.

A local interest has bought about 700 tons of No. 2 foundry for second and third quarter delivery at $16.25, valley. Another company has taken approximately 3,000 tons for second half delivery. Although the price paid for the latter has not been learned definitely, it is reported to have been in the neighborhood of $16.50, valley. Indications are that the demand for foundry iron for second and third quarter will be exceedingly heavy.

Inquiries for malleable and gray forge are light, and few sales of either grade are noted.

Pig Iron Prices.

(Prompt Shipment.)

Bessemer, valley	$18.00
Bessemer, Pittsburg	18.90
Basic, valley	16.00
Basic, Pittsburg	16.90
No. 2 foundry, Pittsburg	17.15
Gray forge, Pittsburg	16.65
Malleable, Pittsburg	17.15

(Second Quarter.)

Bessemer, valley	18.00
Bessemer, Pittsburg	18.90
Basic, valley	16.00
Basic, Pittsburg	16.90
No. 2 foundry, Pittsburg	17.15
Gray forge, Pittsburg	16.65
Malleable, Pittsburg	17.15

Ferro-Alloys.—Sales of small lots of ferro-manganese on a basis of $42.50 to $43.50, Baltimore, are noted, and additional inquiries are coming out. An inquiry for about 50 tons of 50 per cent ferro-silicon for second half is noted. Announcement is made that on April 1 the freight rate on ferro-manganese and ferro-silicon from Baltimore will be reduced from $2.30 to $1.95. On May 1 the freight rate on ferro-manganese and ferro-silicon from Baltimore to Chicago and other western points will be reduced accordingly.

We quote ferro-manganese at $42.50 to $43, Baltimore, for first half, and from $43 to $43.50 for second half. The freight from Baltimore to Pittsburg is $2.30 per ton.

Fifty per cent ferro-silicon is quoted at $62.50 to $63.50, Pittsburg; domestic 12 per cent, $25.90; 11 per cent, $24.90; 10 per cent, $23.90, Pittsburg, for prompt, first quarter, and $1 advance for second quarter. The foreign grades are held at $1 or more a ton over domestic prices.

Plates.—Heavy specifying against contracts and an increase in new bookings over the previous week are reported by makers of plates who are optimistic with regard to the outlook for this branch during the remainder of the year. The T. A. Gillespie Co., Pittsburg, has been awarded the contract for lock bar pipe to be used in the Bull Run water system at Portland, Ore., for which the Shaw-Batcher Co., Sacramento, Cal., was awarded the general contract several days ago. About 10,000 tons of plates will be required, and, while this contract has not been awarded, it will be placed with the Carnegie Steel Co. A feature of the market this week is the additional buying of cars by railroads. The Chesapeake & Ohio has increased its order to 3,000 cars, the Pressed Steel Car Co., American Car & Foundry Co., and the Standard Steel Car Co. receiving an order for 1,000 cars each. The Southern Railway Co. is reported to have placed contracts for 3,600 cars, instead of 1,000 as announced a few days ago. Of this number, it is understood that the Western Steel Car & Foundry Co. will build 2,000 coal cars, the

Standard Steel Car Co. 500 coal cars and 100 flat cars, and the Cambria Steel Co. 500 coal and 500 coke cars. Several other large orders for cars are pending, and additional inquiries for axles are noted. We quote the market as follows:

Tank plates, ¼ inch thick, 6¼ to 100 inches, 1.50c to 1.60c. Extras are as follows, per 100 pounds: Boiler and flange steel plates, 0.10c.; A. B. M. A. and ordinary firebox steel plates, 0.20c; still bottom steel, 0.20c; marine steel, 0.40c; locomotive firebox steel, 0.50c; all sketches, excepting straight taper plates varying not more than 4 inches in width at ends, narrowest end not being less than 30 inches, 0.10c; circles, 0.20c. Plates in widths over 100 inches up to 110 inches, 0.05c; over 110 inches up to 115 inches, 0.10c; over 115 inches up to 120 inches, 0.15c; over 120 inches up to 125 inches, 0.25c; over 125 inches up to 130 inches, 0.50c; over 130 inches, 1c. Gages under ½ inch to and including 3-16 inch plate on thin edge, 0.10c; under 3-16 inch and including No. 9, 0.25c. Five cents extra for less than carloads. Terms, net cash in 30 days.

Sheets.—Price concessions of from $1 to $2 on black sheets and from $2 to $3 on galvanized sheets, for delivery in March and April, are still being offered by a few independent makers, despite the fact that the leading interest and several of the larger independents are booked practically to capacity for five months. Specifications against contracts are exceptionally heavy, and shipments to manufacturers and jobbers are gradually increasing. Further difficulty is being experienced in making deliveries on account of a shortage of cars. Although one or two makers are shading prices on desirable business, premiums are still being offered and in some cases are being accepted by makers who are in a position to accept business for prompt delivery. Present sheet prices, Pittsburg base, are as follows, with $1 a ton added as the delivered price in the Pittsburg district:

Blue annealed sheets, Nos. 3 to 8, 1.70c; Nos. 9 and 10, 1.75c; Nos. 11 and 12, 1.80c; Nos. 13 and 14, 1.85c; Nos. 15 and 16, 1.95c; box annealed sheets, Nos. 10 and 12, 2.05c; Nos. 13 and 14, 2.10c; Nos. 15 and 16, 2.15c; Nos. 17 to 21, 2.20c; Nos. 22 to 24, 2.25c; Nos. 25 and 26, 2.30c; Nos. 27, 2.35c; No. 28, 2.40c; No. 29, 2.45c; No. 30, 2.55c; galvanized sheets, Nos. 12 to 14, 2.50c to 2.55c; Nos. 15 and 16, 2.60c to 2.65c; Nos. 17 to 21, 2.75c; Nos. 22 to 24, 2.90c; Nos. 25 and 26, 3.10c; No. 27, 3.30c; No. 28, 3.50c; No. 29, 3.60c; No. 30, 3.85c; painted roofing sheets, $1.70 per square for No. 28 gage, 2½-inch corrugation, and galvanized roofing sheets, $3 per square for No. 28 gage, 2½-inch corrugation.

Tin Plate.—Considerable tin plate tonnage for second and third quarter delivery is being rejected, as the output of many of the plants has been sold up to Oct. 1. The American Sheet & Tin Plate Co. this week started two additional hot mills at the Shenango plant, four hot mills at this plant having been started last week. The company is now operating 68 of the 70 hot mills in the valley district, and a total of 191 out of an entire serviceable capacity of 235 hot tin mills. There are but two idle mills in the Shenango plant, and the New Castle and Sharon works are operating to capacity. Specifications are heavier than last week, and tin can manufacturers are asking for prompt shipment. This branch is also affected somewhat by the car shortage. The base price on tin plate, over which some premiums have been paid for desirable business, is as follows:

Coke tin plate, 100-pound basis, 14x20, $3.60, f. o. b. mill, Pittsburg district.

Rails and Track Material.—New bookings and specifications for standard and light rails are slightly heavier than last week, and the indications are that the total bookings for the month will exceed the February record. Although the rail market is far from being satisfactory when compared with records of past years, makers feel more optimistic and believe that the second quarter will make a better showing. The leading interest during the week received orders for about 3,600 tons of light rails, which is just double the bookings for the previous week. Several thousand tons of standards in small lots are being entered regularly each week, and with orders now on the books the plants will be assured steady operation for three months at least. The heavier specifying is probably due to the fact that the railroads have started preliminary work as outlined in the 1910 improvement program and are taking their rails in a satisfactory manner. Demand for spikes and track bolts also shows a slight increase. We quote standard Bessemer rails as follows, the base price for open-hearth rails being $30, mill:

Fifty-pound and heavier, 500-ton lots and over, $28; carloads and less than 500 tons, $30; less than carload lots, $32; light rails on base weight of 40 to 45 pounds, $28, the schedule on the other weights being irregular and subject to negotiations; angle splice bars for standard sections, 1.50c, Pittsburg; standard spikes, 1.75c to 1.80c, Pittsburg; hand spikes, 1.80c to 1.85c, Pittsburg; track bolts, 2.50c, Pittsburg.

Steel.—Genuine inquiries for semi-finished material for second quarter delivery are appearing, and a few scattered sales are noted. While the asking price for Bessemer billets is from $27.50 to $28, Pittsburg, it is understood that some makers, who can roll billets on rail mills, are taking small orders for immediate shipment at a slightly lower figure. It is also reported that the $28.50 quotation on Bessemer sheet bars is being shaded, although a local interest within the last ten days sold upwards of 1,000 tons at slightly above $29, makers' mill. Open-hearth billets and forging billets, in some instances, are commanding premium prices. Conditions surrounding the semi-finished steel market during the first quarter have been satisfactory. The Morgan continuous 18-inch mill of the Cambria Steel Co. at Johnstown, Pa., which was completed recently, was placed in operation March 18.

Bessemer 4 x 4 billets with 0.25 carbon and less are quoted at $27.50 to $28, Pittsburg, with the usual extras for size and analysis, and open-hearth rolling billets, from $30 to $31, Pittsburg. Forging billets are quotable at $32 to $33, Pittsburg. Sheet and tin bars are quoted at $28.50 to $29.00 at makers' mill, located within the $1, Pittsburg, freight limits.

Hoops and Bands.—Makers of hoops and bands report that miscellaneous business is steadily increasing as regards both new bookings and specifications. The cooperage business is not as heavy as usually expected at this season. Prices are being maintained. We quote the market as follows:

Hoops in carload lots, 1.60c to 1.65c; in less than carload lots, 1.70c to 1.75c; bands, 1.50c to 1.55c, base, with net extras as per standard steel.

Merchant Bars.—There is a large volume of new business in steel bars coming out, and specifications against contracts also show a gain. On account of the increased demand, local makers of steel bars are not soliciting business at the 1.45c quotation and are taking large orders on the 1.50c basis. Some tonnage is being accepted for third quarter delivery. Deliveries range from four to six months, depending upon the size of the plant. Demand for bar iron is light, although there is fairly heavy tonnage in sight for second and third quarter delivery. It is expected that implement makers will enter the market within the next 30 days for their season's requirements. Shafting business continues heavy. We quote the market as follows:

Common iron bars, 1.65c to 1.70c, Pittsburg; Bessemer and open-hearth steel bars, 1.45c to 1.50c; plow and cultivator, 1.45c to 1.50c; channels, angles, zees, tees, under 3 inches, 1.45c to 1.50c, all f. o. b. mill. The following differentials are maintained on steel: Less

than 2,000 pounds, 0.15c advance; less than 1,000 pounds of a size, 0.35c advance. Cold rolled and ground shafting, 55 per cent in carloads and 50 per cent in less than carloads, delivered in base territory.

Planished and machine straightened tire is 1.70c, base; iron finished tire under 1½ by 1½ inches, 1.65c, both plus net extra on tire card; iron finished tire, 1½ by ½ and over, 1.50c, plus net extra on the steel bar card.

On cold rolled strip steel, with 1½ inches and wider, and 0.100 inch and thicker, we quote base prices for 100 pounds, $3.35 on hard, and $3.60 on soft, except in carload lots of one size, where the price is lower.

Structural Material.—Although the demand for structural material from other sections of the country is steadily increasing, construction work in the immediate Pittsburg district has not started in full. The Jones & Laughlin Steel Co. has taken a contract for 500 tons of steel to be used in the addition to the Consolidated Gas Co.'s building, Pittsburg, and bids have been closed for 500 tons to be used in the Eighteenth Regimental Armory, Pittsburg. Bids for the 1,800 tons for the Oakland (Pittsburg) traction car barns will be invited shortly. It has not been decided when bids will be asked for 8,000 tons to be used in the proposed new bridge across the Allegheny river in the Point district, Pittsburg. Most of the bridge work, for which plans were announced some time ago, is still being held up. Makers of structural steel and fabricators have been advised that a large portion of the bridge and other structural work which has been authorized will be started some time in April, and that a large amount of structural material will be required. While it is reported that some low quotations on beams have been made, local interests say they are not accepting business below the 1.50c basis.

Beams and channels, 15 inches and under, 1.50c to 1.60c; over 15 inches, 1.65c to 1.70c; zees, 1.55c to 1.60c; tees, 1.55c to 1.60c; angles, from 3 to 6 inches, 1.55c to 1.60c; over 6 inches, 1.55c to 1.70c; universal and sheared plates, 6¼ inches wide and wider, 1.55c to 1.60c.

Merchant Pipe.—Owing to the fact that spring buying of oil country goods this year has been unusually light, prices on certain classes of field pipe, consigned to California and other western points, are being shaded $2 a ton and probably more in extraordinary cases. In fact, the price of line pipe for the California territory has been revised and it is possible that other changes will be made. Details of the revision of the price-list have not yet been made public, but likely will be within the next week. Jobbers, who were unable to dispose of their heavy stocks on account of the severe weather conditions, are not expected to enter the market for a few months at least. Recent developments show that makers now have more stock on hand than for a number of years, and, while the outlook for the future is considertd promising, there is no indication as yet that a buying movement can be expected in the near future. The annual convention of the National Association of Jobbers of Wrought Iron Pipe and Fittings, held in Pittsburg last week, did not bring out the new business expected. We quote the following official discounts in carload lots, subject to the usual discount to the largest buyers, merchant pipe, where specified, being offered in from ⅛ to 6 inches, and in plugged and reamed lots:

	—Steel—		—Iron—	
	Black.	Galv.	Black.	Galv.
⅛ and ¼ inch.....	70	54	65	..
⅜ inch	71	57	66	52
½ inch	74	62	69	57
¾ to 6 inch.....	78	68	73	63
7 to 12 inch.....	72	57	67	52
13 to 15 inch.....	51½	..	..	..
PLUGGED AND REAMED.				
1 to 4 inch.....	76	66	71	61
EXTRA STRONG PLAIN ENDS.				
⅛ to ⅜ inch.....	63	51	58	46
½ to 4 inch.....	70	58	65	53
4½ to 8 inch.....	66	54	61	49
9, 10, 11 and 12 inch	59	47	54	42
DOUBLE EXTRA STRONG PLAIN ENDS.				
½ to 8 inch.....	59	48	54	43

Boiler Tubes.—Specifications against contracts and new orders for boiler tubes continue heavy on account of the increased buying of locomotives by railroads. Mill operations have been slightly increased. Demand for merchant boiler tubes also shows a slight increase this week.

	Steel.	Iron.
1 to 1½ inch.....	49	43
1¾ to 1¼ inch.....	61	43
2½ inch	63	48
2¾ to 5 inch	69	55
6 to 13 inch.....	60	43

2½ inch and smaller, over 18 feet, 10 per cent net extra.

2¾ inch and larger, over 22 feet, 10 per cent net extra.

To destinations east of the Mississippi river will be sold at delivered discount for carloads lowered by two points, for lengths 22 feet and under; longer lengths, f. o. b. Pittsburg.

Wire Products. — Conditions surrounding the wire products market are not as favorable as makers expect at this time of the year. There appears to be a little more buying, and with a few weeks of favorable weather, makers believe that some of the orders now pending will be placed. Jobbers are not buying very heavily, and price concessions in some quarters are still reported. Some of the jobbers are still accepting tonnage at the former low quotations on contracts which were to have expired Feb. 11. A local maker recently sent out notice that the price of wire nails would be advanced to $1.90, but another letter was sent out the following day stating that the company would continue to quote $1.85. We quote the market as follows, contracts for the jobbing trade being limited usually to 60 days:

Wire nails, jobbers' carload lots, $1.85; retailers' carload lots, $1.90; painted barb wire, jobbers' carload lots, $1.85; retailers' carload lots, $1.90; with 30c for galvanizing; plain wire to jobbers in carloads, $1.65, and to dealers, in carloads, $1.70; polished staples, $1.85; galvanized staples, $2.15.

Wire Rods.—A slightly heavier demand for wire rods is noted, and specifications also show an increase over the same week in February. New bookings, however, are light as compared with corresponding periods of other prosperous years. We quote the market at $33 and $34, Pittsburg, on Bessemer and open-hearth rods.

Coke.—Aside from the additional inquiries for furnace and foundry coke for second quarter and second half delivery, little change is noted in the market this week. Some sales of small lots have been made at low prices, although a few of the producers and middlemen who were making low quotations some weeks ago are not quoting below $2 at present. The market is unsettled, owing to the fact that miners and operators have not yet agreed on a new wage scale and working conditions for the year beginning April 1. Until definite action is taken on the wage question, it is not expected that the coke market will show a decided change, as sellers are not inclined to quote on contract or for large tonnage under existing conditions. While final action has not been taken as yet regarding the proposed selling agency to handle the output of about 6,000 Connellsville region ovens producing standard coke, it is generally admitted on all sides that this arrangement will not be carried out. Total production of coke in the upper and lower Connellsville region in January and February of this year aggregated 4,171,666 tons, as compared with 2,378,479 tons during the corresponding period of 1909, or an increase of 1,793,192 tons. Coke shipments during January and February showed a corresponding increase. We quote standard Connellsville furnace coke, for prompt shipment, at from $2.10 to $2.25, ovens. There is

practically no contract business being closed at present. Some off-grade furnace coke has been sold for less than $2. On high grade Connellsville foundry coke, we quote from $2.65 to $2.90, ovens, for prompt delivery. On contract, we quote from $2.85 to $3, ovens. The Connellsville *Courier's* figures for the week ending March 12 36,500 ovens active with an output of 464,897 tons, compared with 36,419 active ovens and a production of 467,311 tons the previous week.

Old Material.—Consumers of old material are inquiring more freely for certain grades, and the market as a whole appears to have a firmer tone this week. Prospects of a general buying movement are not bright, but the belief is general that some users will be obliged to enter the market very shortly for sufficient tonnage to induce dealers to advance their quotations on a few grades at least. In fact, a number of consumers are willing to buy, but are not inclined to pay the prices asked. On the other hand, dealers are now in a position to obtain heavy tonnage from producers who apparently have been holding for higher prices. Although some of the consumers have been buying small lots of scrap since December last, stocks at the furnaces are about exhausted. There is fairly good inquiry for heavy melting scrap and No. 1 wrought scrap, and it is doubtful if the latter could be bought below $18. The demand for re-rolling rails is slightly heavier, and as a result dealers are now asking 50 cents more for this grade, the new quotation being from $18 to $18.50. Old car wheels are the only grade on which quotations have been lowered, the general asking price now being from $15.50 to $17. We quote, gross tons, delivered in the Pittsburg district, including Monessen, Sharon, Steubenville, Brackenridge and Follansbee, as follows:

Heavy melting scrap	$16.75 to 17.25
Rerolling rails	18.00 to 18.50
Bundled sheet scrap	14.75 to 15.25
Iron axles	26.50 to 27.00
Old iron rails	18.00 to 18.50
No. 1 wrought scrap	18.00 to 18.50
Old car wheels	16.50 to 17.00
Low phosphorus	20.50 to 21.00
Machine shop turnings	11.50 to 12.00
Cast borings	9.50 to 10.00
No. 1 cast scrap	16.25 to 16.75
Malleable	16.00 to 16.50
Stove plate	12.50 to 13.00

The Virginia Iron, Coal & Coke Co. has announced that on April 1 it will begin exporting coal, coastwise and foreign, using coal from the southwestern Virginia coal fields. The coal will be loaded into ships at Norfolk, Va., where Gordon DeCordy will be resident manager.

CHICAGO.

Round Tonnage of Malleable Purchased—Rumors of Low Southern Prices.

Office of THE IRON TRADE REVIEW,
1328 Monadnock Block, Mar. 22.

The past week has been a rather uneventful one, in the history of the iron and steel markets in Chicago. Some lines seem to be getting their share of business, while others are more quiet. Pig iron continues to be the one best puzzle in the whole list, and the entire trade may fairly be said to be guessing. Prices on Southern iron are undeniably softer, and yet there is a very fair amount of inquiry in the market, and not a little buying, a sale of 12,000 tons of malleable being reported. Finished products are in reasonably good condition, although the past week has not kept up to the record of preceding weeks. Contracts for structural material were smaller and fewer, and there were no sales of standard rails by the local mill, during the week. The Chicago office of an eastern steel company booked orders, however, for 4,500 tons of rails for electric street railways. The demand for light rails is better. Galvanized sheets are weaker, mills making a concession of $1 a ton from current quotations. The local interest will have some of its new mills in operation by May 1, by which time its open-hearth furnaces will be finished. The new pipe foundry of James B. Clow & Sons, of this city, which is located at Coshocton, O., was put in operation, March 17.

Pig Iron.—If there is anyone who thoroughly understands the present situation in the pig iron market, he assuredly must come from a long line of wise men, beside whom Solomon would look very foolish. The most astute men in the business admit that they are at a loss to figure out the puzzle, and those of less penetration and acumen are on the same level, and are engaged in the universal game of guessing. Now and then a good-sized sale comes to the surface, and inquiry is reported to be fair, although in this respect, the Chicago market is said to be in a less fortunate condition than Cincinnati. The largest transaction of the week was a sale of 12,000 tons of malleable Bessemer to the Beaver Dam Malleable Iron Co., at Beaver Dam, Wis., the price not being stated. The business was divided between Milwaukee and Chicago furnaces. The American Car & Foundry Co. is in the market for 10,000 tons of malleable and 5,000 of foundry. The American Radiator Co., whose purchase of 30,000 tons of northern foundry iron was reported in this column last week, is in the market for from 5,000 to 10,000 tons of southern foundry. Local production was increased, on March 16, when Gary No. 6 was blown in, making seven stacks in that group active. The eighth and last of the present program, No. 5, is not yet completed. No. 12, which was the first one completed, and which has been running for 15 months, will soon be blown out, for re-lining. So far as prices are concerned, it is difficult to fix upon a set of figures which will accurately and fairly represent the true state of the market. The most uncertainty prevails in the southern irons, about which one hears a bewildering amount of trade gossip, and there is the widest divergence of views in regard to prices. This week, there are persistent reports that $12.50, Birmingham, is being done, for the remainder of the year, but it is impossible to learn of any bona fide transactions on that basis. It is probable that an occasional furnace might be found which would make sales at that price, for immediate delivery, or for delivery during the first half of the year, but there are other furnaces which will not accept $13, for the third quarter, and refuse to quote for the last quarter. No furnace representative is willing to admit that his company is shading prices, but all are willing to admit that somebody else may be making concessions. Northern foundry No. 2 is holding at $18.25 to $18.75, Chicago, with little business going. Makers of silvery irons are claiming to maintain their schedules, which places them rather beyond the reach of current business.

Lake Superior charcoal	$19.00 to 19.50
Northern foundry No. 2	18.25 to 18.75
Southern foundry No. 2	17.35
Southern silveries, 5 per cent silicon	18.90 to 19.40
Jackson Co. silveries, 8 per cent.	22.40
Malleable Bessemer	18.50 to 19.00
Alabama basic	17.85 to 18.35

Billets.—The situation in the billet market is much the same as heretofore, the local consumer depending almost entirely on eastern mills for supplies outside of running contracts. The Pittsburg price for rolling billets is about $28.00 base, and forging billets $30.00. The stringency which has existed in the billet supply in this district may be lessened when the new 18-inch billet mill of the Cambria Steel Co., at Johnstown, Pa., gets to running full capacity. This mill was successfully started last week, and some of the product may find its way into this market. The Pennsylvania Steel Co. sold 600 tons of rolling billets in this market, the past week.

Merchant Bars.—Business in bar iron and steel is in good condition, and this is especially true of the local demand from warehouse stocks, which continue in a badly broken state. The outlook for large orders from car-building plants continues good.

The Vandalia Line is said to be in

the market for 850 new cars and the Burlington has recently bought 1,000 cars, additional to the 4,000 which were bought by Mr. Hill. Outside competition has compelled local mills to make concessions in prices. The 14-inch merchant mill at Gary, which has been in a condition of "near-readiness" for some time, remains in that condition and it is not probable that the mill will be put in operation before April 1. The 18-inch mill is running very satisfactorily.

We quote for Chicago delivery, as follows:

Bar iron, 1.55c to 1.60c; hard steel bars, re-rolled, 1.60c to 1.65c; soft steel bars and bands and small shapes, 1.63c to 1.68c, base; hoops, 1.78c to 1.88c; planished or smooth finished tire steel, 1.88c to 1.93c; iron finish, up to 1½ by 1½ inch, 1.83c, base, tire card; iron finish, 1½ by ½-inch and larger, 1.68c, base, bar card; channels for solid rubber tires, ¾ to 1 inch, 2.18c, flat, and 1⅛ inches and larger, 2.08c, flat; smooth finished machinery steel, 1 inch and larger, 2.43c; flat sleigh shoe, 1.73c; toe calk steel, 2.23c; spring steel, 2.28c; crucible spring steel, 2.78c; tool steel, 7c to 9c, with higher prices for special grades. Quotations on shafting are 55 per cent off the list for carload lots, and 50 per cent off for less than carload lots, carload freight allowed to points in base territory.

On iron and steel bars from local stocks, we quote as follows: Bar iron, 2c to 2.10c, base; soft steel bars, 1.90c to 2c per 100 pounds, base; soft steel hoops, 2.40c to 2.50c, full extras.

Structural Material.—The amount of building contracts let during the week was not large, but each day brings nearer the time when a large amount of this business will be awarded to fabricators. The contract for the Bankers' Hotel, Oakland, Cal., 2,000 tons, went to Milliken Bros. The Wisconsin Bridge & Iron Co. was awarded 2,000 tons of girder truss and overhead steel crossing arch for the Great Northern, and also contract for 1,700 tons for a power house for the Omaha & Council Bluffs Ry. The American Bridge Co. secured the 18th street bridge at St. Louis, amounting to 800 tons. The Gage Iron Works, of this city, was given a contract for the Boon Garage, 100 tons, also in this city. The Wisconsin Bridge & Iron Co. was awarded a contract for the Pryor avenue bridge at St. Paul, Minn., over the tracks of the Chicago, Milwaukee & St. Paul R. R. The letting of the contract for the Central National Bank building, Denver, Colo., has been postponed until March 26. The time limit for the bids on the 12-story Foster building, in the same city, expired today, and the contract probably will be awarded in a few days.

We quote mill prices for structural shapes, Chicago delivery, as follows:

Beams and channels, 15-inch and under, 1.73c to 1.78c. For extras see Pittsburg report.

Local store prices are as follows: All angles, 3 inches and larger, including 6 inches, $2 to $2.10 per 100 pounds; angles over 6 inches, $2.10 to $2.20 per 100 pounds, base; beams, 3 to 15 inches, inclusive, $2 per 100 pounds, base; channels 3 inches and larger, $2 per 100 pounds, base.

Rails and Track Supplies.—The week passed without any large sales of standard section rails by the leading interest here. There is some improvement in the demand for light rails for which lumber and mining roads are responsible. Mills are being rushed in supplying demands for track supplies. The local sales office of the Pennsylvania Steel Co. reports sales of 4,500 tons of electric railway rails, and special track work amounting to $30,000.

See Pittsburg report for prices on standard sections.

On light rails, Chicago delivery, we quote as follows: Light rails, 40 and 45-pound, $27; 30 and 35-pound, $27.75; 16, 20 and 25-pound, $28; 12-pound, $29.

Track supplies f. o. b. Joliet, angle bars, 1.50c to 1.60c; railroad spikes, 1.85c to 1.95c; smaller size spikes, 1.90c to 2c, base; track bolts with square nuts, 2.40c to 2.60c, base; with hexagon nuts, 2.55c to 2.75c.

Plates.—The outlook in this market is very promising, especially the prospective tonnage from car manufacturing companies, which will be very large. Eastern competition is being felt considerably in this market, and prices are somewhat easier.

We quote, Chicago delivery, as follows. Tank plates, ¼ inch thick, 6¼ to 100 inches, 1.73c to 1.78c. For extras see Pittsburg report.

Store quotations are without change as follows: Tank steel, ¼ inch and heavier, up to 72 inches wide, 2c to 2.10c; from 72 inches to 96 inches wide, 2.10c to 2.20c; 3-16 inch up to and including 60 inches wide, 2.10c to 2.20c; 72 inches, 2.35c to 2.45c; No. 8 up to 60 inches wide, 2.15c to 2.25c. Flange and head quality, 25c extra.

Sheets.—The prospect of a good business for several months is very fair, and the demand for blue annealed sheets has not abated. There is, however, an easier feeling in the lighter gages of galvanized sheets, which is largely due to the slump in the price of spelter. Mill prices are off about $1.00 a ton. The local mill will break its best record of production this month, owing to improvements in practice. A number of the Inland's eight new mills are completed, and could be put into commission if the steel furnaces were ready for use. These will be in operation probably in six weeks.

For mill prices see Pittsburg report. Freight to Chicago, 18 cents.

We quote store prices at Chicago as follows: No. 10, 2.25c to 2.35c; No. 12, 2.30c to 2.40c; No. 14, 2.35c to 2.45c; No. 16, 2.45c to 2.55c; Nos. 18-20, 2.80c to 2.90c; Nos. 22-24, 2.85c to 2.95c; No. 26, 2.90c to 3c; No. 27, 2.95c to 3.05c; No. 28, 3c to 3.10c; No. 30 3.30c; galvanized sheets, Nos. 10 to 16, 3.20c to 3.30c; Nos. 18 and 20, 3.35c to 3.45c; Nos. 22 to 24, 3.50c to 3.60c; No. 26, 3.50c to 3.80c; No. 27, 3.90c to 4c; No. 28, 4.10c to 4.20c; No. 30, 4.50c to 4.60c.

Wire Products.—The spring outlook for all kinds of wire products is exceptionally good, and the expansion in business increases each day. Nothing further is heard of any attempt to cut prices.

We quote, Chicago delivery, as follows: Wire nails, jobbers' carload lots, $2.03; retailers' carload lots, $2.08; retailers' less than carload lots, $2.18; painted barb wire, jobbers' carload lots, $2.03; retailers' carload lots, $2.08; retailers' less than carload lots, $2.18; with 30c for galvanizing; plain wire to jobbers, carload lots, $1.83; plain wire, retailers' carload lots, $1.88; staples, bright, $2.03.

Merchant Pipe and Tubes.—The local trade in wrought steel pipe and boiler tubes is improving each week, and there is a prospect for a very large business during the spring and summer of 1910. As building operations increase, the demand for pipe from this source is enlarging constantly.

For mill discounts, see Pittsburg report.

We quote, out of store, as follows: Wrought steel pipe, black, ⅛ inch to ¼ inch, 68 per cent; ⅜ inch, 69 per cent; ½ inch, 72 per cent; ¾ inch to 6 inches, 76 per cent; 7 inches to 12 inches, 68 per cent. Iron pipe, about 6 points higher.

Lap-welded steel tubes, 2¾ inches to 5 inches, 60 to 62 per cent; charcoal iron tubes, 2¼ inches to 4 inches, 48 to 50 per cent, seamless steel tubes, 2¾ inches to 4 inches, 46 per cent.

Cast Iron Pipe.—During the past week, there has been a succession of merely routine orders amounting to

a fair tonnage, but no large municipal contracts have been let. The new pipe foundry of James B. Clow & Sons, of this city, which is located at Coshocton, O., was started last week. This plant will be operated in connection with the company's original plant at Newcomerstown, O., at least as long as the present prospect for large business in cast iron pipe continues.

We quote prices f. o. b. Chicago, as follows: 4-inch water pipe, $28.50; 6 to 16 inches, $27.50; larger sizes, $26.50; gas pipe, $1 a ton higher.

Old Material.—This market holds its own remarkably well, in view of the fact that the railroads soon will be able to market some of the accumulated scrap which the snow and ice of last winter held in check. Some little buying has been done, from time to time, by consumers, but the total has not been large.

We quote, gross tons, as follows:

Old car wheels	$17.00 to 17.50
Old iron rails	18.00 to 18.50
Rerolling rails (4 ft. and over)	17.75 to 18.25
Old steel rails (2 ft. and under)	16.50 to 17.00
Light section relayers, 45 lbs. and under, subject to inspection	21.00 to 23.00
Relaying rails, subject to inspection	24.50 to 25.00
Frogs, switches and guards	14.50 to 15.00
Heavy melting steel	14.50 to 15.00
Shoveling steel	14.00 to 14.50

We quote, gross tons, as follows:

No. 1 R. R. wrought	14.25 to 14.75
No. 2 R. R. wrought	13.25 to 13.75
Arch bars and transoms	17.25 to 17.75
Knuckles, couplers and springs	14.25 to 14.75
Shafting	17.50 to 18.00
Iron car axles	21.50 to 22.00
Steel car axles	22.50 to 23.00
Locomotive tires	18.00 to 18.50
Dealers' forge	12.00 to 12.25
Pipes and flues	11.25 to 11.75
No. 1 cast, 150 lbs. and less	14.25 to 14.75
No. 1 busheling	12.00 to 12.50
No. 2 busheling	9.50 to 10.00
No. 1 boiler cut	11.25 to 11.75
Boiler punchings	16.50 to 17.00
Cast and mixed borings	6.75 to 7.25
Machine shop turnings	9.75 to 10.25
Railroad malleable	14.25 to 14.75
Agricultural malleable	12.50 to 13.00
Stove plate and light cast scrap	12.25 to 12.75
Angle bars, splices, etc. (iron)	17.00 to 17.50
Angle bars, steel	14.50 to 15.00

M. M. Broad, formerly of the Ohio Iron & Metal Co., and L. J. Newman, formerly of the L. J. Newman Iron Co., have formed a co-partnership under the firm name of M. M. Broad & Co., with offices in the First National Bank building, Chicago, for the purpose of trading in iron and steel scrap. The company plans to do an extensive business as it is in touch with the best markets East as well as West.

The Chicago office of the pig iron brokerage firm of Walter-Wallingford & Co., will be removed, about April 15, to rooms 1003 and 1004 McCormick Bldg., corner Michigan avenue and Van Buren street, which recently was completed.

CLEVELAND.

Foreign Ore Cancellations Excite Interest.—Nut and Bolt Prices Reaffirmed.

Office of THE IRON TRADE REVIEW,
Browning Building, Mar. 22.

Iron Ore.—The announcement that some contracts for foreign ore had been cancelled on account of unsatisfactory results in the blast furnace have aroused much interest in Lake Superior ore circles. So far, eastern furnaces have not manifested any interest in the Lake Superior ore market and there seems to be no immediate prospect of orders being placed.

On base ores with the guarantee of 55 per cent on old range and Mesabi Bessemer, and 51½ per cent on old range and Mesabi non-Bessemer, we quote as follows: Old range Bessemer, $5; Mesabi Bessemer, $4.75; old range non-Bessemer, $4.20; Mesabi non-Bessemer, $4.00.

Pig Iron.—One Cleveland foundry is in the market for 2,000 tons, and other inquiries in this city amount to about 3,000 tons, making the largest total with the exception of the Westinghouse inquiry that has been pending for a long time. There is a general disposition on the part of buyers to seek lower prices, and very few transactions have taken place. Corrigan, McKinney & Co. hope to have their new furnace in blast early in April. We quote delivered in Cleveland as follows:

No. 1 foundry	$17.00 to 17.25
No. 2 foundry	16.50 to 16.75
No. 2 Southern	17.35
Gray forge	16.40
Bessemer	18.90
Lake Superior charcoal	19.50
Jackson Co. 8 per cent silvery	21.55

Coke.—There is very little business, either in furnace or foundry grades and prices are irregular. We quote Connellsville furnace coke at $2.25 for prompt delivery and $2.25 to $2.40 for first half. Foundry coke, prompt delivery, is quotable at $2.65 to $2.85, and for first half at $2.75 to $3.00.

Finished Materials.—Deliveries of steel bars are still long delayed. One important interest will not promise delivery in less than 30 weeks. The Carnegie Steel Co. has a very large volume of orders on hand, and is quoting regularly 1.50c. There is general demand by users of steel bars to make contracts, but sellers are not anxious to do so at the present time. The leading interest is very conservative, and independent interests are also exercising much caution in making extended contracts. It is understood that some contracting has been done with the agricultural interests. The Eastern Steel Co., Pottsville, Pa., advises that the statement is incorrect that it has sold as low at 1.47c Pottsville, but reports indicate that some low quotations are being named by independent interests in eastern territory, especially for shipments east of their plants. The nut and bolt manufacturers held a meeting a few days ago and reaffirmed prices. Business in nuts and bolts is very satisfactory. Fair prices are being obtained for bar iron for delivery in the city and its immediate vicinity, and there is not a great deal of cutting of prices. Jobbers are doing a very heavy business, the only trouble being in getting deliveries on contracts with the mills. The large business in shafting which jobbers are doing is one of the indications of a strong demand for actual requirements on the part of consumers.

Old Material.—Dealers report the outlook as somewhat improved and prices are stronger. However, there does not seem to be any ground for advancing previous quotations. We quote gross tons, f. o. b. Cleveland, as follows:

Old iron rails	$17.50 to 18.00
Old steel rails (under 6 feet)	17.00 to 17.50
Old car wheels	16.50 to 17.00
Old steel boiler plate	13.50 to 14.00
Malleable iron (railroad)	15.00 to 15.50
Steel axles	20.00 to 20.50
Malleable iron (agricultural)	13.50 to 14.00
Heavy steel	14.75 to 15.25
Country mixed steel	12.50 to 13.00

We quote, net tons, as follows:

No. 1 R. R. wrought	$15.00 to 15.50
No. 1 busheling	12.50 to 13.00
No. 1 machine cast	14.25 to 14.50
Axle turnings	10.50 to 11.00
Machine shop turnings	8.75 to 9.50
Grate bars	11.50 to 12.00
Pipes and flues	11.00 to 11.50
Tank iron	10.50 to 11.00
Sheet iron	6.00 to 6.50
Wrought drilling	8.75 to 9.25
Stove plate	11.50 to 12.00
Cast borings	8.00 to 8.50

CINCINNATI.

In Spite of Some Sales, Pig Iron Market is Weak.

Office of THE IRON TRADE REVIEW,
N. E. cor. Fourth and Elm Sts., Mar. 22.

Pig Iron.—A fair sprinkling of sales has come forward during the past week, and several melters are said to be feeling the market, in the way of inquiries. The effect of these sales, however, has not been just what could be desired, and general market conditions continue weak, and prices are unsettled and irregular. Consumers, generally are disposed to be somewhat nervous over the situation, and apparently have made up their minds to wait until the time arrives when they are satisfied that prices have reached low levels, before making any new

contracts for future requirements. It is perhaps a matter of indifference to many of them, just when this time comes, as it is safe to predict that at least 90 per cent have all the iron they need for several months to come, and requirements for future use can be deferred until actual necessity demands action. Southern furnaces, as a rule, are practically on a $13.00, Birmingham, basis for prompt, and into third quarter, and $13.50 for fourth quarter delivery. These quotations, however, are somewhat elastic, and are not being strictly adhered to; in fact, a greater portion of the sales mentioned has been made at prices below these figures. It is thought that the next week or two will establish a minimum price that will put quotations on a firmer basis. Northern irons are nominally quotable at $16.00 prompt, and $16.50 last half delivery, Ironton furnace, but sales have been made at a shade lower figure. Silvery is in light demand, and prices are a little weak. There is an inquiry for 2,000 tons of northern foundry, from a concern in northern Ohio, delivery over the last half of the year. A local manufacturer wants 500 tons of foundry, silicon 2.50 per cent and over and 500 tons foundry, silicon 1.75 per cent and over, reasonable prompt shipment desired. A central Ohio melter bought 2,700 tons divided between two northern and four southern, which reports indicate went a shade below quotations. We quote for any delivery during the year, based on freight rates of $3.25, Birmingham, and $1.20 from Ironton, as follows:

Southern foundry No. 1	$16.75 to 17.25
Southern foundry No. 2	16.25 to 16.75
Southern foundry No. 3	15.75 to 16.25
Southern foundry No. 4	15.75 to 16.25
Southern No. 1 soft	16.75 to 17.25
Southern No. 2 soft	16.25 to 16.75
Southern gray forge	15.75 to 16.25
Northern No. 1 foundry	18.20 to 18.70
Northern No. 2 foundry	17.70 to 18.20
Northern No. 3 foundry	17.20 to 17.70
Jackson county 6 per cent silicon	20.20
Jackson county 8 per cent silicon	21.20
Jackson county 10 per cent silicon	22.20

Coke.—Some inquiry has developed during the week, but new contract business is very light. Consumers are evidently awaiting a settlement of the controversy between the coal operators and miners, before anticipating future requirements. Prices apparently have not materially changed, and in the leading coke producing districts are as follows:

	Prompt shipment.	First half of year 1910.
Connellsville district:		
Foundry coke	$2.65 to 3.00	$2.75 to 3.00
Furnace coke	2.00 to 2.25	2.30 to 2.40
Wise county district:		
Foundry coke	2.75 to 3.00	2.75 to 3.00
Furnace coke	2.10 to 2.25	*Sliding scale basis.
Pocahontas district:		
Foundry coke	2.75 to 2.90	2.85 to 3.10
Furnace coke	2.25 to 2.50	2.75 to 3.00
New River:		
Foundry coke	2.75 to 3.00	2.90 to 3.25
Furnace coke	2.25 to 2.50	2.35 to 2.50

*Sliding scale basis means $1.60 for coke based on $9, Birmingham, for pig iron, with an advance of 16⅔ per cent of the amount over $9 at which pig iron is quoted. This is the usual basis. Other forms of sliding contracts are also made.

Finished Material.—Inquiries along structural lines are said to be some better and demand for plates and axles is more active. On Saturday, the Louisville & Nashville Railroad closed for 4,000 tons of structural, to be used in construction of cars at its Louisville shops. Mills are still several months behind in steel bar deliveries, and requests to rush shipments are of daily occurrence. Steel bars and small shapes, sold on steel bar card are quotable at 1.50c, base, Pittsburg, and plates and structural 1.60c, net, Pittsburg.

Old Material.—The market continues irregular and prices are weak and show considerable latitude. There does not appear to be any urgent call for anything on the list, yet disposition is made of all scrap that comes forward, and there is no noticeable accumulation. We quote dealers' prices as follows:

No. 1 railroad wrought, net tons	$13.00 to 13.50
No. 1 machinery, net tons	13.00 to 13.50
No. 1 busheling, net tons	11.50 to 12.00
Old iron rails, gross tons	18.00 to 18.50
Old steel rails (rerolling), gross tons	17.00 to 17.50
Old short lengths, gross tons	15.00 to 16.00
Old iron axles, net tons	19.00 to 19.50
Heavy melting scrap, gross tons	13.50 to 14.00
Stove plate, net tons	10.00 to 10.50
Heavy turnings, net	9.00 to 9.50
Cast borings, net tons	7.00 to 7.50
Car wheels	15.50 to 16.00
Grate bars	11.00 to 11.50

PHILADELPHIA.

Large Buyers Holding Out for Lower Prices.—Finished Steel Better.

March 21.

Pig Iron.—Some increase in inquiry has developed the past week but sales are still confined to the ordinary current business which in the aggregate reaches only a moderate tonnage. The cast iron pipe companies in this territory, which have been in the market for a large tonnage of low grade irons, have made some purchases against these inquiries but these purchases have been principally in odd lots put up to them at attractive prices and usually in Southern grades. They are still figuring upon large blocks and it is probable that as much as 50,000 tons would be bought, if the bottom figures at which these interests are aiming, are reached. At present buyers and sellers are about 50 to 75 cents apart in their views of prices and negotiations are being prolonged, the consumers holding out for about $16 delivered on Southern forge or $11.50 to $11.75, Birmingham. Northern forge is apparently out of the competition since makers are asking from $17 to $17.25 delivered. Eastern Pennsylvania No. 2X foundry of standard analysis continues from $18.25 to $18.50 with about $1 less being done on Lebanon grades. Some farther western makers who are dumping some iron into this district are taking some business at about $18 delivered for good No. 2 grades for early shipment. An inquiry for 1,600 tons of foundry iron for second quarter came out this week. Basic iron appears a little easier although the market has not been tested by recent buying. Buyers are keeping in closer touch with it than they have been and are offering $17.50 delivered with no takers. The market is quotable at from $18.25 to $18.50 delivered. Small lots of low phosphorus are going and one inquiry for 750 tons is current. One of the largest makers is out of the market because of difficulty of getting ores. A sale of 1,000 tons of malleable for last half at $18.25 delivered is noted. The Eastern Pig Iron Association's monthly meeting last week showed a favorable condition of reduced stocks though there was some decline in new orders booked. Furnace operations continued practically unchanged over the previous month.

On first half for Philadelphia delivery we quote as follows:

No. 1X foundry	$18.50 to 19.00
No. 2X foundry	18.00 to 18.50
No. 2 plain	17.50 to 18.00
Standard gray forge	17.00 to 17.25
Basic	18.25 to 18.50
Low phosphorus	23.00 to 23.50
No. 2 Birmingham	17.00 to 17.50
No. 2X Virginia	18.25 to 18.50
No. 2 plain, Virginia	17.75 to 18.25

Finished Material.—An improvement in finished lines is generally reported as specifications against contracts are very liberal and a fair amount of new business is being entered. Easiness of shape prices on attractive lots is still to be noted but on ordinary tonnages 1.55c to 1.60c, Pittsburg, or 1.70c to 1.75c Philadelphia is being done. Plate prices are showing no inclination to soften in sympathy with shapes and range from 1.55c to 1.60c with Pittsburg mills while Eastern makers report their ability to regularly command 1.60c. The delivery situation with leading mills, which is significant of the strength of the various products, shows two to three months on steel bars, two to three months on plates and two to three weeks on shapes. The railroads are buying in

increasing quantities. The Southern Railway has an inquiry in this market for the steel for 75 locomotives. Large frog and switch manufacturing companies report they have more business of this sort upon their books than ever before in history. The Philadelphia & Reading is having plans prepared for the elevated track and other construction work at Kensington, this city, which is a part of the large improvements being made by this road in Philadelphia and vicinity and about 10,000 to 12,000 tons will be needed for the portion in sight. Bids on the Columbia avenue station for the same road, 400 tons, went in this week. On the Denver post-office, 3,000 tons, for which figures have been submitted, it is understood Cleveland and Philadelphia contractors are lowest.. J. Henry Miller, Baltimore, is the low bidder on the Richmond, Va., government building, 1,200 tons. The drawings will be out next week for the Emerson hotel, Baltimore, which will require 2,000 tons. The Mercy hospital in the same city, from 600 to 700 tons, is now up. The Bethlehem Steel Co. has taken 800 tons for the naval hospitals at Newport, R. I., Chelsea, Mass., and Portsmouth, N. H., for which the Noel Construction Co., Baltimore, is the general contractor and about 400 tons of plain shapes will also be needed. The extensive lock work on the Panama canal which, as previously reported will require about 40,000 tons of plates is now before the general contractors and the mills are receiving advance notification of this prospective business. Some tin plate business for third quarter shipment is being taken in this territory at the present market.

We quote for Philadelphia delivery as follows: Structural shapes 1.70c to 1.75c; plates 1.70c to 1.75c; steel bars 1.60c to 1.65c; refined bar iron 1.55c to 1.60c; open-hearth, 4 x 4 rolling billets $30.60.

Old Material.—The puddling mills have been showing some need of iron scrap of late and an increased buying has been done which has resulted in advances in No. 1 wrought, wrought pipe and cast borings. The situation with the associated mills has not changed very much, though they are now buying a little steel at the reported price of $16.50, delivered. Embargoes continue at Pottsville and South Bethlehem, and other plants are taking only selected stock. There has been some buying of heavy steel at neutral plants between the eastern and middle western markets for Pittsburg at about $17, delivered. We quote gross tons for Philadelphia delivery, as follows:

Old steel rails (rerolling)	$17.75 to 18.25
Heavy melting steel	16.25 to 16.75
Old car wheels	16.50 to 17.00
Old iron car axles	26.00 to 27.00
Old steel car axles	22.50 to 23.00
No. 1 railroad wrought	19.00 to 19.50
Wrought pipe	16.25 to 16.75
Cast borings	11.25 to 11.75
Wrought turnings	13.00 to 13.50
Heavy cast scrap	16.00 to 16.50
Railroad malleable	16.50 to 17.00
Stove plate	12.00 to 12.50

NEW YORK.

Softness in Pig Iron Continues—Ore Contracts Cancelled.

Office of THE IRON TRADE REVIEW,
Room 1005, No. 90 West St., Mar. 22.

Iron Ore.—Because of reported dissatisfaction with results obtained in output arising chiefly from physical characteristics of the ore, some cancellations of contracts for certain grades of foreign ore has been done by eastern furnace interests. One company is understood to have freed a shipper from the obligation of 30,000 tons. The foreign market having advanced considerably since these contracts were originally made, the sellers have apparently been not unwilling to make the cancellations. There has been a little additional selling of low phosphorus ores to eastern furnaces at advanced prices and the high rates at which chartering was done on this cargo, 12s 6d from Marbella to Philadelphia, reflect the high freights prevailing, although it is understood some special considerations were involved and this port usually takes higher rates because of restricted harbor facilities. The previous chartering to this port was done at 9s 6d for January delivery. Further chartering at 9s 6d has been done from Sagunto and the general freight market at present ranges from 9s 6d to 10s. About 15,000 tons of Spanish ore arrived at the port of Philadelphia the past week. In eastern domestic ores, there has been some additional buying in small lots for shipment before July 1. One sale of 8,000 tons of New Jersey grades is noted and other tonnage is under negotiation.

Pig Iron.—A better inquiry for iron is coming out and sales are being made more freely, but generally at the expense of prices, which continue rather ragged. Southern iron at $13, Birmingham, or $17.25, New York, for No. 2 continues to come into the eastern market in larger quantities because of the favorable delivered price for buyers as against that of the makers of the district. In some cases the $13 price has been shaded by southern furnaces. The aggregate of southern business going to New York and New England territory, however, is not heavy. The market for good brands of eastern Pennsylvania No. 2X ranges from about $18 to $18.25 at tidewater. These prices continue to be undersold on some makes of No. 2X. A Connecticut hardware manufacturer has closed for from 6,000 to 8,000 tons of Nos. 2 and 3 foundry for shipment to practically the end of the year, the business going to upper New York furnaces. Pending foundry inquiry is larger in 1,000 tons and less lots. Apparently due to the weakness of basic in the central west, which is reported as available at $15.50, valley, the eastern market is easier. A sale of 1,000 tons for prompt shipment at less than $18, delivered, was made this week. An inquiry for 750 tons of low phosphorus for a New Jersey user for extended shipment is current. The meeting of the Eastern Pig Iron Association in this city the past week disclosed a favorable statistical situation in the east, where stocks are now estimated at between 40,000 and 50,000 tons. A reduction of about 5,000 tons from the preceding month's stocks was reported. A falling-off in new orders booked was also apparent, but there is still a large unfilled tonnage on books. We quote, delivered at New York tidewater over the first half, as follows

Northern foundry No. 1	$18.50 to 18.75
No. 2X foundry	18.00 to 18.25
No. 2 plain	17.50 to 17.75
No. 2 southern foundry	17.00 to 17.50
Malleable	18.50 to 18.75
Gray forge	17.00 to 17.25

Ferro-Alloys.—A light buying of ferro-manganese is being done in the east and sales of the week were about 400 tons. Pittsburg and western users have a fair inquiry out in 500 tons and less. Prices are rather easy. There is little demand for 50 per cent ferro-silicon from the west. We quote, 80 per cent ferro-manganese at from $42.50 to $43, seaboard, and 50 per cent ferro-silicon at from $60 to $60.50, seaboard.

Finished Materials.—There is a broadening of new buying activity in various iron and steel products, but the movement is still very gradual, although prospects continue to improve. Specifications against contracts are being maintained at a high rate and the mills are all in favorable positions as to bookings with the exception of structural shapes, where need of tonnage and a consequent irregularity in prices still obtain. Structural lettings of the past week have been rather light. Fabricating prices continue to develop some weak spots. Milliken

Brothers, Inc., have 2,000 tons for the Bankers' hotel at Oakland, Cal., and the American Bridge Co. has taken 350 tons for repair shops for the Kansas City, Mexico & Orient, at Wichita, Kan. Some new inquiry for bridge work by the railroads is coming out. The Cincinnati, Hamilton & Dayton railroad is asking prices on 1,600 tons, the Hocking Valley on about 1,500 tons and the Baltimore & Ohio 600 tons. Bids will go in April 12 on the Middletown, Conn., bridge for the New York, New Haven & Hartford railroad, which will require from 1,200 to 1,500 tons. Additional tonnage is expected to be shortly asked for by the Pennsylvania railroad for its Baltimore terminal improvements. The drawings are not yet out for the Merchants' Exchange building, this city, of the New York Central, which will take 8,000 tons. Bids have gone in on a loft building for the Potter interests at Broadway and Astor place, this city, 2,000 tons. The bids for the extensions of the New Jersey Zinc Co., at Palmerton, Pa., 4,000 tons, are still under consideration. The Gates oil interests are inquiring for about 500 tons of plates for tank construction in Texas.

We quote, New York delivery, as follows:

Angles, 3 to 6 inches x ¼ inch and heavier, 1.66c to 1.76c; beams 3 to 15 inches, 1.66c to 1.76c; tees, 3 x ¼ inch and heavier, 1.66c to 1.76c; plates, carload, tank, 1.66c to 1.76c; marine boiler, 2.06c to 2.16c; bar iron, 1.60c to 1.65c; soft steel bars, 1.61c to 1.71c.

Cast Iron Pipe.—A better demand is coming from gas and water companies, but public lettings in the east are not very numerous. The 6,000 tons of pipe for New York City has been placed by the contractors with different makers. The leading interest has taken 4,000 tons for Atlanta, Ga. Bids have gone in for 300 tons for New Brunswick, N. J. Six-inch pipe is openly quoted at from $25.50 to $26, f. o. b. New York, in carload lots.

Rails and Track Material.—The New York, New Haven & Hartford railroad has placed its rail tonnage with the Maryland Steel Co. and the Bethlehem Steel Co., the former receiving 9,000 and the latter 4,500 tons. Open-hearth rails will be furnished for early delivery. The Boston Elevated Railway Co. has awarded about 1,500 tons of girder and tee rails to the Pennsylvania Steel Co. and about 1,000 tons for the same road is reported to have gone to another Pennsylvania interest. The Delaware, Lackawanna & Western is in the market for 500,000 tie plates.

Old Material.—Little improvement in the scrap market of New York and vicinity has developed and the condition of apathy among large buyers prevails. Where prices for heavy steel have been offered, these have usually been below the ideas of sellers in this territory. Some tonnage from the Panama canal under the recent bulk award continues to reach this port and is being accumulated at Greenville, N. J., where it is being placed in condition for the market. Some sales of old car wheels from these lots at $14.50, delivered, are noted. The price paid the government for the bulk lot by the buyers now offering the tonnage was $19.25 gross tons tidewater. We quote, gross tons, prices New York dealers will pay at tidewater, with exception of cast scrap, which has a local demand, as follows:

Old steel rails (re-rolling)	$15.50 to 16.00
Old car wheels	14.00 to 14.50
Old iron axles	23.00 to 24.00
Old steel shafting	19.50 to 20.00
Heavy melting steel	14.25 to 14.75
No. 1 R. R. wrought	16.50 to 17.00
Iron track scrap	15.00 to 15.50
Wrought pipe	13.75 to 14.25
Cast borings	9.00 to 9.50
Wrought turnings	10.00 to 10.50
Heavy cast scrap	15.00 to 15.50
Railroad malleable	15.00 to 15.50
Stove plate	11.00 to 11.50
Grate bars	11.75 to 12.25

ST. LOUIS.

Car Building Plant Has Taken Fair Tonnage and is Out for More.

March 21.

Pig Iron.—One of the largest car manufacturing plants in the St. Louis territory is reported to have placed an order for 10,000 to 12,000 tons of car wheel, gray forge and foundry iron since last Saturday, of which several thousand tons were for Northern car wheel iron, and it is said to be in the market for additional tonnage. The selling price was not made public, but the competition is known to have been keen. An inquiry is out in the St. Louis territory today for 1,000 tons of Southern foundry for last half delivery, and still another inquiry for 2,300 tons of car wheel and Southern iron from an Illinois concern. The market, despite these orders and inquiries, is rather dull in the opinion of some sales agents, while others contend that the outlook is good. There is a feeling, however, that iron may advance or decline 50 cents a ton before long. Southern No. 2 is quoted at $13 Birmingham basis, today, with a freight rate to St. Louis of $3.75. In the minds of some local sales agents $13.50 is nearer correct, but a real bona fide offer could probably find plenty of $13 iron. Our prices delivered, to which the Birmingham freight of $3.75 has been added, follow:

Southern No. 1	$ 17.25
Southern No. 2	16.75
Southern No. 3	16.25
Southern No. 4	15.75

Ohio iron is quoted at from $16 to $16.50, Ironton, for all deliveries.

Coke.—The coke market is dull, production is fully up to the demands, and there is no immediate indication of improvement. We quote 72-hour Connellsville foundry coke at $2.50 to $2.75 a ton, with best grades selling at $2.75 to $3 for last half delivery. Connellsville 48-hour furnace coke is offered at $2 to $2.25 for prompt delivery, and at $2.25 to $2.50 for last half shipment. Virginia 72-hour foundry coke is bringing $2.75 to $3, and Virginia 48-hour from $2 to $2.25 for all deliveries. The freight to East St. Louis is $2.80, and $2.70 from the Virginia fields when shipment is destined beyond St. Louis.

Finished Material. — The following base prices are quoted out of stock: Tank plates, ¼-inch and heavier, up to 72 inches wide, 2.05c to 2.15c; from 72 to 96 inches, 2.15c to 2.25c; sheets, No. 10, blue annealed, 2.30c to 2.40c; bar iron, $1.85 to $2.05 base; soft steel bars, $1.95 to $2.05 base.

Old Material.—There is no change in the dull condition of the market, with prices nominally as follows:

Old car wheels	$17.00 to 17.50
Old iron rails	19.00 to 20.00
Rerolling rails (4 ft. nad over)	16.75 to 17.25
Old stel rails e(2 ft. and under)	16.50 to 1.00
Light section relayers, 45 lbs. and under, subject to inspection	21.00 to 23.00
Relaying rails, subject to inspection	24.50 to 25.00
Frogs, switches and guards	15.50 to 16.00
Heavy melting steel	15.50 to 16.00
Shoveling steel	14.00 to 14.50

We quote, net tons, as follows:

No. 1 R. R. wrought	$14.50 to 15.00
No. 2 R. R. wrought	13.50 to 14.00
Arch bars and transoms	17.50 to 18.00
Knuckles, couplers and springs	15.00 to 15.50
Shafting	17.00 to 17.50
Iron car axles	20.00 to 21.00
Steel car axles	20.00 to 21.00
Locomotive tires	18.00 to 18.50
No. 1 country wrought	12.25 to 12.75
Pipes and flues	11.75 to 12.00
No. 1 cast 150 lbs. and less	14.00 to 14.50
No. 1 busheling	13.00 to 13.50
No. 2 busheling	9.75 to 10.25
No. 1 boiler cut	11.50 to 12.00
Boiler punchings	13.00 to 14.00
Cast and mixed borings	7.50 to 8.00
Machine shop turnings	10.00 to 10.50
Railroad malleable	13.25 to 13.75
Agricultural malleable	11.50 to 12.00
Stove plate and light cast scrap	11.50 to 12.50
Angle bars, splices, etc. (iron)	17.25 to 17.75
Angle bars, steel	15.50 to 16.00

BUFFALO.

Recent Sales at Low Prices Have Depressing Effect.

Office of THE IRON TRADE REVIEW,
932 Ellicott Square, Mar. 22.

Pig Iron.—Contracts closed last week at prices under quotations have

had a slightly depressing effect upon this market. Inquiries today are not heavy, but there is more interest shown in iron for last half deliveries. Prospective buyers, however, are holding back, apparently in doubt about the future market. Consumers of small tonnage are showing more activity and buying to cover pressing needs. We quote, f. o. b. furnace, as follows:

No. 1X foundry	$17.50 to 18.00
No. 2X foundry	17.00 to 17.50
No. 2 plain	17.00 to 17.25
No. 3 foundry	16.75 to 17.00
Gray forge	16.75 to 17.00
Malleable	17.50 to 17.75
Basic	18.00 to 18.50
Charcoal	20.00 to 21.00

Finished Products.—Large tonnage inquiries are still absent from the market but the principal feature today lies in the coming out of specifications on small projects involving from 100 to 200 tons of structural. These include the Auditorium theater at Rochester, and the New York Central station at Watertown, also a small hotel project at Akron, N. Y.

Old Material.—The market is depressed, scrap being very quiet. It has been dull for several months and the situation has not improved, as some had believed it would. It is not improbable that prices will fall below quotations named. That is the present outlook. We quote, gross tons, f. o. b. Buffalo, as follows:

Heavy melting steel	$15.50 to 16.00
No. 1 railroad wrought scrap	17.00 to 17.50
No. 1 railroad and machine cast scrap	15.00 to 15.50
Old steel axles	20.00 to 20.50
Iron axles	25.00 to 26.00
Car wheels	17.00 to 18.00
Railroad malleable scrap	16.25 to 16.75
Machine shop turnings	9.00 to 9.50
Cast iron borings	8.25 to 8.75
Low phosphorus steel scrap	19.50 to 20.00
Old iron rails	18.00 to 19.00
Tank iron	13.00 to 13.50
Sheet iron	9.00 to 9.50
Stove plate	13.50 to 14.00
Pipe and flues	13.00 to 13.50
Grate bars	12.00 to 12.50
Boiler plate	13.50 to 14.00

BIRMINGHAM, ALA.

Tonnage Sold Probably Larger—Quotations Somewhat More Uniform.

March 21.

Pig Iron.—The aggregate tonnage sold in this market during the past week is probably larger than for the week previous, but does not represent a higher price. There has been a very material increase in the number of inquiries received, and as the leading melters—in a majority of cases—are represented, the outlook is considered improved. Quotations are more uniform than for some weeks past, and the $13, Birmingham, schedule is understood to be the market price for deliveries during the remainder of this year. That price could probably be made to apply to deliveries extending through the second quarter into the third, but strictly third quarter or second half deliveries it is not believed that better figures than a basis of $13.50 per ton, Birmingham, could be elicited. A leading interest quotes $13.75 per ton, Birmingham, for last half deliveries, and is known to have refused a lot of 500 tons for April shipment on a basis of $13.25 per ton. One or more lots of special analysis iron have been recently sold for $14 per ton, Birmingham, where delivery extending into the last quarter was required. It is probable that the $13 per ton Birmingham, basis can be shaded on strictly spot deliveries, owing to the resale iron known to be available, as well as the iron now in merchants' hands and on warrant yards; although no evidence of unusual efforts on the parts of such interests to dispose of their holdings has recently been reported. Latest reports from the furnaces indicate that further additions have been made to stocks during this month, and it is commonly understood that speculative holdings have been reduced very little, yet the demand even for small lots is more general than for some weeks past, and it seems quite reasonable to believe at this time that the trade has not been as well provided for in the activities of some months past as is generally indicated. In this respect, particular reference is made to the cast iron pipe manufacturers, who are the leading consumers in the immediate district.

Cast Iron Pipe.—This market is fairly active, although considerations are generally small and prices received are more satisfactory. No lettings of consequence are reported to come up in the near future, though a number of extensions and improvements are being contemplated that will require considerable tonnage for southern points. So far no stock of consequence is in evidence, and all plants are working on full time. The movement to the northwest has increased very materially, with more favorable weather, and in other directions shipments are now being made against contracts heretofore held in abeyance. We quote water pipe as follows, per net ton, f. o. b. cars here: Four-inch to 6-inch, $24; 8-inch to 12-inch, $22; over 12-inch, average of $20, with a dollar a ton extra for gas pipe.

Old Material.—A revision of quotations is not authorized, but the market is considered weak with buyers interested only in bargains. The movement from dealers' yards has recently been heavy by reason of deferred shipments against contracts having been ordered out, but the new tonnage entered so far this month is very unsatisfactory. We quote dealers' asking prices as follows, per gross ton f. o. b. cars here:

Old iron rails	$15.50 to 16.00
Old steel axles	17.50 to 18.00
Old iron axles	19.50 to 20.00
No. 1 railroad wrought	14.00 to 14.50
No. 2 railroad wrought	12.00 to 12.50
Dealers' wrought	12.00 to 12.50
Old steel rails	12.50 to 13.00
No. 1 machinery	12.50 to 13.00
No. 1 steel	13.00 to 13.50
Light castings, stove plate	9.50 to 10.00
Cast borings	6.00 to 6.50
Old standard car wheels	13.50 to 14.00

BRITISH IRON MARKET.

Pig Iron Market Steady.—Finished Material Looks Better.

Office of THE IRON TRADE REVIEW, Prince's Chambers, Corporation St., Birmingham, Eng., March 12.

The pig iron market may be described as steady and satisfactory as business is proceeding in fair volume and prices are hardening. Yesterday's quotation for Cleveland was 51s 6½d ($12.61) cash with 52s 3½d ($12.79) three months. The amount in store is 414,914 tons, representing a slow increase. The month looks like being a good one for shipments. There are plenty of inquiries from European countries other than Germany. In that country there appears to be a glut of material and little prospect of pig iron importations. Italy is buying on a very satisfactory scale. The hematite market is showing a very decided improvement, and is making the pace rather more rapidly than ordinary departments so that the steady improvement in the steel trade is in the highest degree hopeful for this branch of raw material. In the Scotch market, smelters are finding a strong demand and the position of hematite in particular is impregnable, and producers declare they will not accept less than 70s for forward deliveries.

Finished Material.—The most significant feature of the trade is the increasing improvement of finished iron as compared with pig iron. A week ago, there was a meeting of unmarked bar makers with a view to united action in a price advance, and one effect of this was that several firms issued circulars declaring an advance of 5s per ton, but the movement is far from general. Wire makers have now joined the ranks of the dissatisfied.

METAL MARKETS.

ST. LOUIS.

March 21.

Lead and Zinc.—Zinc blende brought a high price in the Missouri-Kansas-Oklahoma district last week of $48 a ton for 60 per cent grades, with standard qualities bringing $42 to $45 a ton. For ore running high in iron, $46 a ton was paid. These figures are $1 a ton lower than was paid the week before. It is estimated that the surplus ore in the district was reduced upwards of 5,000 tons. The average price paid for all grades was $42.16, as compared to $43.68 the previous week. Spelter brought a high price at St. Louis Saturday of 5.55c as compared to 5.65c for the week before. Calamine sold as high as $30 a ton for choice lots, with 40 per cent grades bringing $25. The average price per ton was $26.22, as compared to $24.64 of the previous week. Lead ore brought a top price of $52 a ton, with an average price of $51.60. Pig lead closed at St. Louis Saturday at 4.32½c, as compared with 4.42½c the week before.

NEW YORK.

March 22.

Copper.—The market has been somewhat easier this week under the influence of published figures, showing a further increase in daily production over February, and a smaller export total estimated for March. Electrolytic has declined to 13.37½c for domestic delivery and 13.25c f. o. b., New York, for foreign account. Lake can be had at 13.75c and casting at 13.25c. Consumption continues good both at home and abroad, but with the large increase in domestic visible supply, predicted for this month, and the unconsumed balance of shipments made to Europe since Jan. 1, 1909, hanging over the market, a further advance is not looked for by the well informed.

Tin.—From the low price of 31.60c reached March 17, spot tin advanced to 32c early in the past week and held there until freer offerings again came on the market Monday, and depressed the price to 31.90c. Today's news from London indicates, however, a stronger tone and spot likely to close on a parity with 32c in New York, March 31.75c, April 31.95c and May 32c.

Commenting on the tin market, a representative of a large foreign house stated that the statistical position, showing a probable increase of 5,000 tons in visible supply since March, 1909, with the price £15 to £20 above the average for 1909, does not justify the belief that the price will advance appreciably in the near future. The consumption demand, however, is better than when the price was lower.

Lead.—The leading interest made a further reduction of 10 points in the price of lead to 4.50c in New York, March 18. This was only following the lower prices made earlier in the week by outside sellers. Lead can be bought today at from 5 to 10 points under 4.50c in New York, and up to now the cut has not attracted buying in a sufficiently large volume to warrant the prediction that the next change in price will be upwards.

Spelter.—The market has been quiet and slightly lower; probably in sympathy with other metals. One producer, who handles a high grade spelter, reports he is 50 per cent sold up for 90 days in all grades, and 75 per cent for brass foundry spelter, at prices considerably above those prevailing today. Business can be done at 5.65c, New York and 5.50c, St. Louis, with slight concessions for future contracts.

Antimony. — Prices are without change from the last report. Cookson's can be had at 8.50c, Hallett's at 8.25c. Less desirable brands are obtainable at 7.50c.

CHICAGO.

New Metals.—The past week has been a very quiet one in the local metal market, there being no interest in the futures in copper, and prices on that metal and on lead were easier. Spelter seems to lack strength, and there are reports to the effect that prices are being shaded. No doubt a large buyer could obtain better terms than are reflected in current quotations.

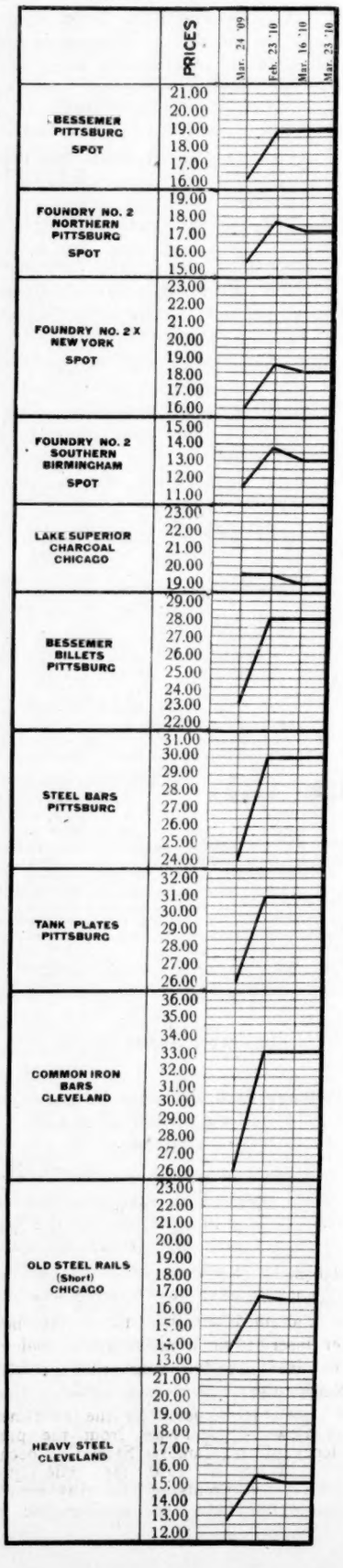
We quote as follows: Lake copper, carload lots, 13⅞c to 14c; casting, 13⅝c; smaller lots, ¼c to ⅜c higher. Spelter, 5.65c to 5.70c; lead, desilverized, 4.50c to 4.60c in 50-ton lots, corroding, 25c per 100 pounds higher; sheet zinc, 7.75c list f. o. b. La Salle in car lots of 600-pound casks; pig tin, 33c to 33¼c; Cookson's antimony, 10½c; other grades, 9¾c to 10¼c.

Old Metals.—This market is neglected, beyond a little routine business which keeps coming along whether prices be high or low. Lead scrap is a little weaker, in sympathy with the new metal.

We quote dealers' selling prices, as follows:

Copper wire, 13½c; heavy copper, 13½c; light copper 11½c; heavy red brass, 12⅝c; heavy yellow brass, 9¼c; light brass, 7¼c; No. 1 red brass borings, 10¼c; No. 1 yellow brass borings, 8c; brass clippings, 9½c; tea lead, 3.65c; lead scrap, 4.10c; zinc, 4¼c; tin pipe, 30c; tin foil, 27½c; pewter, 24c; electrotype plates, free from wood, 4½c; electrotype dross, 3¼c; stereotype plates, 5c; stereotype dross, 3½c; prime slab zinc dross, $80 per ton.

PRICE CHART.



PRESIDENT PRICE

Is Given a Banquet By Employes of Cambria Steel Co.

President Charles S. Price, who, on March 17 became president of the Cambria Steel Co. in succession to Powell Stackhouse, who retired after a service of over half a century with the company, was tendered a complimentary dinner by the operating heads and sales forces last Saturday evening. The usual formalities of an affair of this kind were dispensed with and the occasion was marked by the feeling of good will and co-operation extended to the new executive, who for many years has been general manager of the big Johnstown, Pa., plant, and himself intimately connected with it since 1876, in various capacities and who has established himself throughout the country, if not the whole world, as a successful and scientific steel maker. He has primarily been an operating man, as have a very large majority of the present-day executive heads of the large steel companies.

During the course of his remarks, President Price grew reminiscent, and drew from his fund of recollections many anecdotes pertaining to occurrences during the 34 years with which he has been with the Cambria Steel Co. He recalled the fact that practically all of the steel companies of the present day in the United States have in their organizations, as engineers or operating heads of some department men who started with the Cambria company.

In behalf of his associates in all departments of the organization, Fred. Krebs, manager of sales, in a neat speech presented Mr. Price a handsomely engraved silver loving cup, which came as a happy surprise to the new president. The cup bore the following inscription:

Presented to
CHARLES S. PRICE
by his friends
in commemoration of his election to
the Presidency of the
Cambria Steel Co.
Johnstown, Pa., March 19, 1910.

At the same time, a handsomely executed memorial, signed by those present was dedicated to Powell Stackhouse, the retiring president, who was unable to attend. This memorial, bound in morocco and lined with silk, the subject matter inscribed in a most artistic manner, contained the following tribute to Mr. Stackhouse:

Upon the occasion of the retirement of Powell Stackhouse from the presidency of the Cambria Steel Co., occurring March 17, 1910, the undersigned officers and agents of the company desire to make the following expression of their sentiments in this regard.

We congratulate Mr. Stackhouse upon the completion of an exceptionally long and successful active connection with a single interest, beginning in 1856 with his engagement by Messrs. Wood, Morrell & Co., the predecessors of the Cambria Iron Co. and the Cambria Steel Co. and extending, through a constantly increasing measure of responsibility until he assumed in 1891 the presidency of the Cambria Iron Co. and in 1898 the presidency also of its successor, the Cambria Steel Co. This is a record of over half a century of faithful and successful effort on behalf of the Cambria interests, broken only by the services rendered by Mr. Stackhouse during the civil war, beginning with his enlistment in 1861 in response to President Lincoln's call for 75,000 volunteers and terminating with his mustering out June 4, 1865, with the rank of major.

We assure Mr. Stackhouse that we appreciate the ability which he has shown in the discharge of his duties as an executive officer and we especially recognize the high integrity, the capacity for leadership and the strength of grasp which have characterized his administration.

While acknowledging that at threescore years and ten a man has earned the right to withdraw from the forefront of the battle of life, we still wish for Mr. Stackhouse very many years more of happy and useful, even if less strenuous, life and shall always cherish the privilege of having worked under a leader who combined, with a forceful personality, insuring the respect of those under his authority, an element of justice and consideration which gained their cheerful loyalty and a friendly attachment which will remain unbroken.

Harry S. Endsley, solicitor for the Cambria Steel Co., was toastmaster at the dinner tendered President Price, and introduced the latter, who for many years has been general manager of the big Johnstown plant. The toasts were as follows: "How to keep the plant running?—By adding fuel to the flames," by Marshall G. Moore, mining engineer for the company; "The Agencies—Those arteries which convey the product of the body corporate to other parts of the world," by Clifford J. Ellis, of the Chicago office; "Correct Finance—Always to make both ends meet," by Alex. P. Robinson, vice president of the Cambria Steel Co.; "The Outlook—Our Future," by Fred Krebs, manager of sales of the Cambria Steel Co.

Those present at the dinner were: C. S. Price, president; A. P. Robinson, vice president; D. B. Gehley, secretary; E. T. Stuart, treasurer; Fred Krebs, manager of sales; W. E. McHenry, auditor; T. Matheson, actuary; W. W. Whitney, purchasing agent; Joseph Morgan, consulting engineer; H. S. Endsley, solicitor; John W. Gocher, chief engineer; J. H. Geer, engineer of construction; G. E. Thackray, structural engineer; E. F. Kenney, metallurgical engineer; M. G. Moore, mining engineer; C. R. Stewart, superintendent of open hearths; J. I. Souther, superintendent of blast furnaces; F. E. Thompson, superintendent of Bessemer works; T. F. Hamilton, superintendent of Gautier works; J. C. Ogden, superintendent of mechanical department; W. S. Weaver, superintendent of car shops and structural; C. W. Parkhurst, superintendent of electrical department; V. S. Doebler, superintendent of transportation; L. R. Steur, superintendent of order department; L. A. Wakefield, axle and forge department; Joseph Masters, superintendent of real estate; A. B. Cooper, superintendent of teams and farms; Frank Carney, superintendent of Cambria police; H. C. Wolle, general superintendent; J. L. Replogle, assistant to president; James Cranston, superintendent of roll shop; W. A. Sproull, general freight agent; B. J. Picking, cashier; R. V. Sage, steel car engineer; D. J. Jones, assistant works treasurer; E. J. Dotterer, assistant general manager of sales; Frank Phillips, assistant auditor; S. M. Marshall, assistant chief engineer; F. S. Hyde, chief chemist; J. M. Cook, assistant mining engineer; H. B. Barnard, assistant superintendent of open hearth; F. W. Bryan, assistant superintendent of blast furnaces; J. C. Fox, assistant superintendent of Bessemer department; David Marker, assistant superintendent of Gautier Works; E. W. Clarke, assistant superintendent of mechanical department; C. N. Replogle, assistant superintendent of car and structural; William Oldham, assistant superintendent of electrical department; J. H. Morley, assistant superintendent of transportation; J. C. Davis, assistant solicitor; D. M. Stackhouse, assistant general superintendent; C. E. Curtis, field engineer; G. T. Robinson, superintendent of mines; D. T. Corning, civil engineer; B. C. Alexander, general foreman of open hearths; R. C. Glazier, assistant superintendent of blast furnaces; Benjamin Bosler, assistant superintendent of machine shops; G. W. Wertz, agent; J. N. Tabor, superintendent of coke ovens; F. C. Yeates, assistant to purchasing agent; Dr. W. B. Loroman, hospital surgeon; Geo. Moore, paymaster; C. S. McKinley, W. H. Phillips.

The following district sales representatives were present: H. W. Hayes, Chas. Carter, Boston; H. L. Waterman, L. B. Morris, New York; W. S. Ottinger, M. C. Edwards, Philadelphia; W. E. McLain, Jack McLain, Pittsburg; A. D. Davis, Buffalo; E. D. Rogers, Walter Smyth, Cleveland; J. L. Adams, W. F. Vosmer, Cincinnati; Clifford J. Ellis, Harvey Cosley, George Bangart, Chicago; H. P. Hubbell, F. W. Goerner, St. Louis; W. K. Stone, Atlanta; A. Morrison, Pittsburg; Campbelle Robison, credit manager.

EXTENSIVE PLANS

Will More Than Double Plant of Hiram Swank's Sons.

Hiram Swank's Sons, fire brick manufacturer of Johnstown, Pa., has just announced extensive plans which will more than double its capacity and greatly extend its field of operations. For about a year it has been negotiating for coal, clay and gannister properties in Clearfield county, Pa., and the deal has now been closed whereby it secures 900 acres of land containing an eight-foot vein of soft clay, extensive coal lands and easy access to an unlimited supply of gannister rock at Irvona, South Clearfield county, Pa., together with a 12-acre manufacturing site on the Pennsylvania railroad and New York Central lines. The company has also purchased 700 acres of block flint clay land at Faunce, Clearfield county, and 700 acres near Blandburg, Cambria county, Pa.

The company's operations at Johnstown have been confined largely to the manufacture of runner brick and special shapes, stopper rod sleeves and ladle nozzles, but upon the completion of the new plant about the middle of the present year, the Clearfield county works will be devoted almost exclusively to the manufacture of 9-inch firebrick for use in blast furnaces, cupolas, open-hearth and heating furnaces, while the old plant will operate almost exclusively on runner brick.

The buildings at the Irvona plant will consist of the main drying floor building, 300 by 75 feet; the grinding and engine room building, 140 by 30 feet, and a stock shed 300 by 25 feet. All buildings will be of brick and steel. There will be 18 new kilns with a daily capacity for burning 40,000 9-inch brick. The company will not install fast plant machinery, but has announced that it will retain the old method of manufacturing handmade brick.

The general machinery equipment will consist of four 9-foot grinding pans, four Erie Economic boilers, one 250-horsepower Atlas engine and one high-speed engine with generator for lighting purposes. Electric drills will be used for mining the clay, as this is a drift proposition and steam shovels cannot be used.

The main offices of the Hiram Swank's Sons Co. will remain at Johnstown.

The business of this firm was established in 1856 by Hiram Swank, father of the four members of the firm at the present time. The father is still alive and in excellent health.

NEW CAST IRON PIPE PLANT STARTS.

Chicago, March 21.

The new cast iron pipe foundry of James B. Clow & Sons, of this city, at Coshocton, O., began operations, March 17, and has been running on alternate days since that time. On March 28, the foundry will go on full time, after the ten-day try-out. The machine shop connected with the new plant has been running for some time. The sale of the firm's original plant at Newcomerstown, O., is in abeyance, for the present, owing to the prospects for an unusually heavy demand for cast iron pipe, during the coming summer, as the firm does not wish to be hampered in the matter of production.

STEEL SCRAP MELTED IN A CHARCOAL IRON FORGE FIRE.

Editor IRON TRADE REVIEW:—

On reading your editorial, "Tin Plate Nomenclature," in your issue of Mar. 17, 1910, page 509, the writer finds several statements which he believes inaccurate, and, as your editorials are generally of a high order, and not to discredit American metallurgy, trust you will correct the impression given.

For example: Your remark, "Steel scrap stuck together in a charcoal fire," and other statements, would lead the uninformed to the conclusion that genuine charcoal iron could not be made without originally utilizing charcoal pig iron; whereas, in the plant of the Parkesburg Iron Co., steel scrap is often used to be melted and refined in a charcoal iron forge fire, the resulting blooms as per our daily analysis, will rarely exceed, even to a slight extent, the following amounts of impurities:

Carbon	0.02
Manganese	0.02
Sulphur	0.02
Phosphorus	0.04
Silicon	0.02

or a total of 0.12 of 1 per cent.

These blooms, having physical and chemical composition of blooms sunk from charcoal pig iron, and containing 99.88 per cent iron, we consider a proof that charcoal iron can be obtained today.

The Parkesburg Iron Co.,
By George Thomas 3d, Treasurer.
Parkesburg, Pa., Mar. 18, 1910.

COPPER VISIBLE SUPPLY

The visible supply of copper, March 15, was recorded at 112,730 tons, compared with 113,406 tons on March 1 last, and 52,370 tons on March 15, last year.

At the annual meeting of the stockholders of the Temple Iron Co., at Reading, Pa., these officers were chosen: President, George F. Baer; vice president and treasurer, F. Law; directors, George F. Baer, James S. Harris, M. H. Truesdale, E. B. Thomas, F. C. Smink, Thomas P. Fowler, F. D. Underwood, Albert Broden and W. J. Richards.

DROP FORGING PLANT

Acquired and Operated by New Pittsburg Concern.

The Diamond Forging & Mfg. Co., of Pittsburg, which was incorporated last February, has acquired the plant and property of the old Pittsburg Tubular Steel Whiffletree Co., manufacturers of the "Everlasting" Tubular Steel whiffletrees, eveners, neck yokes, etc., as well as a complete line of heavy wagon forgings. The new company, in addition to manufacturing all of the goods heretofore produced by the whiffletree company, is also making automobile forgings of all kinds. New heavy steam drop-hammers and other modern machinery for that purpose have been installed.

The plant, including warehouse and offices, is located in lower Allegheny, at the corner of Chartiers street and Ridge avenue, and occupies about 20,000 square feet of land. The officers of the Diamond Forging & Mfg. Co. are: President, W. D. Henry, president of the National Fireproofing Co.; secretary-treasurer, D. M. Smith, son of Frank B. Smith, late deceased president of the Crucible Steel Co. of America; vice president and general manager, D. R. Wilson, for the past nine years connected with the Crucible Steel Co. of America.

PHILADELPHIA SYMPATHETIC STRIKE IS ON THE WANE.

The general sympathy strike of skilled labor at Philadelphia in connection with the carmen's trouble, appears to be on the wane, and the repudiation of the past week by the striking traction employees of a proffered settlement from their employers has resulted in many workmen returning to their shops. The Standard Roller Bearing Co., of which 1,600 men went out, is again in full operation and officials of the Baldwin Locomotive Works report that almost all that portion of their force which joined in the movement, has returned. The William Cramp & Sons Ship & Engine Building Co. has been little affected by the strike. The file department of Henry Disston & Sons, Inc., at Tacony, from which about 500 men struck, is still in operative. The other departments of the plant are working as usual.

C. H. Lewis & Co., brokers, pig iron and coke, are removing their offices this week from the Park Bldg., Pittsburg, to room No. 944 in the new Henry W. Oliver Bldg., Pittsburg.

BUILDING FOUNDRY.

The A. B. C. Castings Co., Cleveland, Has Let Various Contracts.

The A. B. C. Castings Co., Cleveland, has been organized with $100,000 capital to engage in the manufacture of aluminum and brass castings. A site 70 x 574 feet has been purchased at Carnegie avenue and East 65th street, on which a plant will be erected 70 x 324 feet. The melting equipment will consist of nine pit furnaces, coke fired, and three gas fired aluminum furnaces. Five core ovens will be installed and the melting equipment as well as these ovens will be furnished by the J. D. Smith Foundry Supply Co., Cleveland. Contract for the other foundry equipment, including flasks, molding tubs, etc., was placed with the S. Obermayer Co., Cincinnati. Ground has already been broken for the plant which will probably be placed in operation in May. Temporary offices have been established at 146 Superior Arcade. The officers of the company are: I. Levy, president; T. L. Johnson, vice president; A. D. Levy, secretary and treasurer, and H. E. Behr, general manager.

NEW FURNACES START.

Four new open-hearth steel furnaces, the last of the group ordered, and upon which construction work began about 18 months ago at the Homestead plant of the Carnegie Steel Co., have been completed and are now in operation. About 20 new furnaces have been added within the last few years. The Homestead works now has a total of 64 open-hearth furnaces. The last four were added to what is known as No 4 open-hearth mill.

TWO MORE MILLS.

The Follansbee Brothers' Co., Pittsburg, has started preliminary work on the construction of two additional sheet mills at the Follansbee, W. Va., plant. It is expected that the new sheet mills will be ready for operation in September. This will make four sheet mills in the plant, in addition to the six tin mills.

MIDDLESBROUGH SHIPMENTS ARE BEING RECEIVED.

A considerable amount of Middlesbrough pig iron contracted for a number of months ago continues to be received at Atlantic ports. The steamer Dundonia reached Philadelphia last week with several thousand tons consigned to Delaware river interests. The steamer Napa, loaded with a cargo of 3,400 tons of pig iron, ferro manganese, etc., put in at Belfast after having started on the trip across and is now booked to sail March 27. Half of this cargo will go to Philadelphia and the remainder to Baltimore. Some tonnage of Middlesbrough iron is being regularly received at Portland, Me., and this is principally for Canadian shipment. The steamer Cervona is now en route with about 625 tons of iron consigned to this port.

ST. LOUIS BRANCH OF NATIONAL METAL TRADES ASSOCIATION.

J. T. Orr, assistant treasurer of the Moon-Hopkins Billing Machine Co., was elected chairman of the St. Louis branch of the National Metal Trades Association, at a banquet given by the association at the Mercantile Club, St. Louis, Tuesday. The association decided to elect a chairman instead of a president for its chief officer.

The following members were chosen honorary members of the executive committee: E. H. Steedman, of the Curtis Mfg. Co.; W. E. Whitman, of the Whitman Agricultural Co.; H. B. Krenning, of the Dorris Motor Car Co.

For regular members of the executive committee, these were chosen: W. R. Jones, of the Reuter-Jones Mfg. Co.; B. H. Sanders, of the American Foundry & Mfg. Co.; W. C. Essmueller, of the Essmueller Mill Co.

The executive committee will select a secretary and treasurer at a future date.

WILL LAY STEEL TIES.

The 1910 construction program of the Bessemer & Lake Erie railroad includes the laying of about 114,000 steel cross ties. The annual report shows that previous orders for steel ties by this road amounted to 355,355 ties. The new steel ties, weighing about 8,000 tons, will be furnished by the Carnegie Steel Co.

British Institute:—The annual conference this year of the Iron & Steel Institute will be held at Buxton in September. The Duke of Devonshire has consented to preside. Buxton is a well known inland watering place and has been selected on account of its central position with regard to the Northern and the Midland iron and steel producing districts.

The Union Bridge & Construction Co., Kansas City, Mo., has increased its capital stock from $50,000 to $100,000.

ANNUAL REPORT OF OTIS ELEVATOR CO.

Approval was voted for an issue of $3,500,000 convertible 5 per cent debenture bonds of the Otis Elevator Co., at a special meeting of the stockholders March 21. At the same time, the increase of the common stock of the company from $6,500,000 to $10,000,000 was voted to provide for the conversion of the debentures. At the annual melting following, the retiring directors were re-elected. The annual report shows the largest net earnings in the history of the company. The report for the year ending Dec. 31, 1909, compares as follows:

		Increase.
Net	$1,048,689	$215,916
Dividends, pref'd. stock	378,600	225
Balance	$ 670,089	$215,691
Common dividend	191,259	Unchanged
Balance	$ 478,830	$215,691
Charges for deprec.	362,845	149,706
Surplus	$ 115,985	$ 65,985

GREAT NORTHERN ORE ANNUAL REPORT.

The report of the trustees of the Great Northern Iron Ore Properties, for the year ending Dec. 31, 1909, compares with the report for the year ending Dec. 6, 1908, as follows:

	1909.	Decrease.
Dividends	$1,560,000	$185,000
Int. and misc. receipts	.....	4,214
Total	$1,560,000	$189,214
Exp. of trust	77,094	*1,704
Dist. to cert. holders	1,500,000	.....
Total	$1,577,094	*$ 1,704
Balance deficit	17,094	*190,918
Previous surplus	256,073	*173,824
P. and L. surplus	$ 238,979	$ 17,094

* Increase.

The trustees say in the report that shipments of ore increased from 1,468,925 tons in 1908, to 3,016,619 tons in 1909.

NEW SHEET MILLS AT MASSILLON BEING STARTED.

The Massillon Rolling Mill Co., Massillon, O., which started one of its new mills March 10 and another the day following, expects to place the remaining three mills in operation within a few weeks. The main building of the plant, which was originally 320 feet long, has been extended 240 feet further. When the five sheet mills are in operation, it is estimated that the capacity of the plant will be about 35,000 tons of finished products each month.

The Nelson Foundry Co., Milwaukee, has amended its charter to increase its capital from $6,000 to $15,000.

STRUCTURAL CONTRACTS

Pending and Awarded in St. Louis Territory.

St. Louis, March 23. (By wire.)

The Missouri Bridge & Iron Co. has secured the contract for about 800 tons of steel to be used in completing the north end of the Eighteenth street viaduct at St. Louis and has let a contract with the American Bridge Co. for 500 tons of steel to be used in making the girders. The contract for about 500 tons of steel to be used in the framework of the new Schubert Memorial theater, Twelfth and Locust streets, St. Louis, will be let in a few days. The Laclede Gaslight Co., St. Louis, is preparing to erect a new building which will require a considerable tonnage of steel.

The Wisconsin Bridge Co. has secured the contract for 1,800 tons of steel to be used in constructing a power house for a traction company in Omaha. Several bridge companies in St. Louis were bidders for the work. The bids were received by Lichter & Jens, of St. Louis, the consulting engineers. Small orders for structural steel are coming to the St. Louis territory in a satisfactory manner.

WILL SELL WOODSTOCK FURNACE PLANT.

The plant of the Woodstock Iron & Steel Corporation, with two blast furnace stacks at Anniston, Ala., will be offered for sale March 28, in the offices of the referee in bankruptcy at Birmingham. At the recent meeting of the creditors, W. E. Leake, of Birmingham, one of the receivers, was appointed trustee of the bankrupt Woodstock corporation.

COKE IS VERY WEAK.

Pittsburg, March 23. (By wire.)

The coke market continues weak and in some quarters producers are being urged to make still further curtailment in production. A sale of a small lot of furnace coke for prompt shipment at $1.65, ovens, is noted, and several other small lots have been sold at $1.75 ovens. Producers of standard Connellsville furnace coke, however, are asking $2.10 to $2.25, ovens.

CONTRACT FOR NEW TUBE PLANT AWARDED.

Pittsburg, March 23. (By wire.)

Contracts have been awarded by the Keystone Tube Co. for a new plant to be built at Connellsville, Pa. Work is to be started immediately, and it is expected that the plant will be in operation shortly after the middle of the year. The company bought five acres and has an option on 12 additional acres. The company, which is capitalized at $200,000, will make tubes of from ⅝ to 4 inches. I. W. Bollinger, Pittsburg, is president; P. C. Perrot, of Beaver Falls Pa., is vice president; James E. McNairy, Pittsburg, is treasurer, and Joshua Nuttall, Pittsburg, secretary.

ANDREW CARNEGIE AT CHICAGO PRESS CLUB.

Chicago March 22.

The Press Club of Chicago has extended an invitation to Andrew Carnegie, to be present at a luncheon in his honor at the club's building, 118 Dearborn street, on Thursday, March 31, and Mr. Carnegie has accepted the invitation.

PERSONAL.

Louis Mohr, of John Mohr & Sons, Chicago, is at the office again after a siege of the grip.

L. W. Francis, secretary of Witherbee, Sherman & Co., Inc., New York, has returned from a trip to Cuba during which he inspected some of the iron ore operations of the island.

J. E. Ferguson, until recently associated with Jos. T. Ryerson & Son, at Chicago, has been appointed expert and manager of sales for the Manitowoc Steam Boiler Co., of Manitowoc, Wis.

F. Hunter has resigned as master mechanic of the North Sharon, Pa., works of the Carnegie Steel Co., to become superintendent of the Whitaker-Glessner tin plate mill at Wheeling, W. Va.

Benjamin Talbot, inventor of the Talbot furnace and managing director of the Cargo Fleet Steel & Iron Works, Middlesbrough, Eng., will arrive in the United States in a few weeks on a business trip.

W. P. Snyder, of W. P. Snyder & Co., Pittsburg, accompanied by his daughter, Miss Mary Snyder, has returned after spending a month's vacation, which included a trip to the West Indies and South America.

W. P. Rogers has retired from the firm of Murray & Rogers, manufacturers' agents, Farmers' Bank building, Pittsburg. Mr. Murray will continue business as Pittsburg representative of all the companies formerly represented by Murray & Rogers.

Louis J. Horwitz, formerly vice president and general manager of the Thompson-Starrett Co., New York, general contractors, has been elected president to succeed Albert B. Boardman, who resigned to become chairman of the board of directors.

Ray S. Fox, who was formerly identified with Hickman, Williams & Co., brokers, pig iron, coke and alloys, at Cincinnati and St. Louis, is now associated with Walter-Wallingford & Co., brokers in pig iron, coke and alloys, in the Cleveland and Pittsburg territory.

John Bradley, son of J. C. Bradley, formerly superintendent of Pratt & Letchworth, Buffalo, who for some years has been superintendent of the Grand Rapids Malleable Works, Grand Rapids, Mich., will leave April 1 for Buffalo to become identified with the Cary Safe Co. Several days ago a number of Mr. Bradley's friends tendered him a dinner in token of their esteem.

OBITUARY.

John McLean, one of the oldest employes and a director of the H. K. Porter Locomotive Co., died at the home of his mother, at Barking, Pa., near Oakmont, Pa., March 19.

Harry Hamilton, secretary of the General Motors Co., and general manager of the Rapid Motor Co., died at Pontiac, Mich., March 20, aged 43. He organized the Rapid Motor Co., located at Pontiac.

Frank E. Walker died from the effects of a stroke of apoplexy at his home in Chicago, March 20. Mr. Walker formerly was vice president of the Wells & French Car Co., which, in 1899, was merged into the American Car & Foundry Co.

Samuel Joseph, president of the Continental Iron & Steel Co., with offices in New York and Pittsburg, died March 15 at Nice, France, following an operation for appendicitis. He was 55 years of age. The Continental Iron & Steel Co. is a dealer in relaying rails and old material.

Ned Boughter, department manager of the United States Metal Mfg. Co., at Lebanon, Pa., died of pneumonia March 21, after an illness of about 10 days. Mr. Boughter was well and favorably known throughout the iron and steel trade in eastern Pennsylvania and New York state, and was at one time in partnership with former Mayor Hess of Lebanon.

The Eagle Charcoal stack at Attalla, Ala., was relighted, March 8, after being idle for several years.

Market Opens Weak but Closes Stronger

Prices declined rather sharply during the early part of the last week, but the market strengthened later. The labor situation during the week seemed to improve somewhat, but the latest figures on the balance of trade and the rise in the discount rate of the bank of England were depressing factors.

Monday, the market was exceedingly dull and price changes were small. The money markets were firmer, and the increase of the discount rate of the bank of England was anticipated. The unfavorable crop reports tended to increase the price of wheat. Tuesday, the stock market was active, and prices were lower. The foreign trade statement issued that day was unfavorable, but a favorable event was the decision of the railway unions to accept mediation, thereby averting a strike, at least temporarily. Wednesday the market was weak and closed at net losses throughout the greater part of the list. Crucible Steel declared its regular quarterly dividend and issued a satisfactory statement. Thursday, the bank of England discount rate was raised from 3 to 4 per cent, and rates for money were stronger in New York and Paris. Stocks were dull but firm. Friday, the tone of the market was firm, and Norfolk & Western, and Lehigh Valley made new high records. Saturday, the market was dull and closed lower. The political crisis in Washington did not appear to have much effect on prices. The New York bank statement made a better showing than was expected.

Money on call closed Saturday at 2½ per cent. The range during the week was from 2 per cent to 3¼, the latter being the highest rate since Jan. 25. Time money was firmer. Clearings throughout the United States were estimated at $3,524,329,984, against $3,365,369,289 the week before, and $2,767,947,623 for the corresponding week of last year. The report of the clearing house banks showed loans decreased $20,951,500, deposits decreased $20,811,400, surplus increased $7,423,450, and the ratio of reserve was 26.2, against 25.6 the week before. Trust companies and non-member banks showed loans and investments increased $3,756,100; deposits decreased $2,528,000, and the percentage of reserve 17.3 against 17.4 the week before. Exports of gold from New York were reported at $98,200, while imports were $409,513.

THE LEADING INDUSTRIAL SECURITIES.

	Closing Quo. Mar. 19	Changes in week	Ann. M'f'g Date 1910	Stock Outstanding	Basis	Dividend Last Dividend	Dividend Date Last Div. Pay.
Allis-Chalmers	11⅞	— ⅜		$19,820,000			
Allis-Chalmers, pr	45	.....		16,150,000	7 cum.	1¾ Q.	Feb., 1904
American Can	11¾	— ¼	Feb. 2	41,233,300		1¾ Q.	
American Can, pr	76	.....		41,233 300	7 cum.	1¼ Q.	Apr., 1910
Am. Car & Fdy	65	+ ⅜	June 24	30,000,000		½ Q.	Apr., 1910
Am. Car & Fdy., pr	118½	—1¼		30,000,000	7 n. c.	1¾ Q.	Apr., 1910
American Loc	51½	—1½	Oct. 18	25,000,000	5	1¼ Q.	Aug., 1908
American Loc., pr	114	+1		25,000,000	7 cum.	1¾ Q.	Jan. 1910
Am. Ship	75	+ ½	Oct. 12	7,600,000	4	1 Q.	Mar., 1910
American Ship, pr	111½	.....		7,900,000	7 cum.	1¾ Q.	Jan. 1910
Am. Steel Foundries (new)	60	+ ¼	Dec. 1	17,184,000		1¾ Q.	
Barney & Smith	32	—3	June 7	2,000,000	4	.....	Sept., 1907
Barney & Smith, pr	103	—5		2,500,000	8 cum.	1 Q.	June, 1908
Bethlehem Steel	31	+ ¾	April 5	14,862 000		.....	
Bethlehem Steel, pr	60	—1		14,908,000	7 n. c.	¾ Q.	Feb., 1907
Cambria Steel	49	— ½	Mar. 15	45,000,000	5	2½ S. A.	Feb., 1910
Cambria Iron	45	—1¾		8,468 000*	4	2 S. A.	Apr., 1910
Chicago Pneumatic Tool	45	—1	Feb. 21	6,145,000	4	1 Q.	Apr., 1910
Colorado Fuel	40½	.....	Oct. 17	34,235,500		1¾ Q.	Apr., 1902
Crucible Steel	15	— ½	Oct. 19	24,578,400		3½.	
Crucible Steel, pr	90½	+1⅛		24,436,000	7 cum.	1¾ Q.	Mar., 1910
Empire Steel	13	.....	Feb. 23	1,254,770		.....	
Empire Steel, pr	82	+2		2,500 000	6 cum.	3 S. A.	July, 1909
Fay & Egan	40	.....	Feb. 15	1,000,000	7	3 S. A.	Feb., 1910
Fay & Egan, pr	108	+3		1,000,000	7 cum.	1¾ Q.	Nov., 1909
General Electric	154½	—1	May 10	65,179,600	8	2 Q.	Apr., 1910
Harbison-Walker	35	— ½	Jan. 17	18,000,000		2 Q.	Oct., 1907
Harbison-Walker, pr	94	+1		9,600,000	6 cum.	1½.	Oct., 1909
International Pump	46	.....	May 10	17,762,500		1 Q.	Apr., 1905
International Pump, pr	86½	—1½		11,350,000	6 cum.	1½ Q.	Feb., 1910
Lackawanna Steel	46	—4	Mar. 9	34,978,000		.....	
Lake Sup. Corp	24	— ⅞	Oct. 5	40,000 000		.....	
New York Air Brake	80¾	—6¾	June 16	10,000,000	8	2 Q.	Oct., 1907
Niles-Bement-Pond	101	.....	Feb. 2	8,500,000	6	1½ Q.	Mar., 1910
Niles-Bement-Pond, pr	104	.....		2,000,000	6 cum.	1½ Q.	Feb., 1910
Otis Elevator Co	54	+2	Mar. 21	6,375,300	3	1½ S. A.	Oct., 1909
Otis Elevator Co., pr	99	.....		6,295,000	6 n. c.	1½ Q.	Jan., 1910
Pa. Steel	65	.....	May 9	10,750,000		.....	
Pa. Steel, pr	115	+1		16,500,000	7 n. c.	3½ S. A.	Nov., 1909
Pittsburg Coal Co	22	+ ⅜	Mar. 8	28,104,600		.....	
Pittsburg Coal Co., pr	72½	—1½		27,071 800	7 cum.	1¾ Q.	Jan., 1910
Pressed Steel Car	43	—2	Feb. 16	12,500,000		1 Q.	Aug., 1904
Pressed Steel Car, pr	102	—1⅝		12,500,000	7 n. c.	1¾ Q.	Feb., 1910
Pullman	196	.....	Nov. 9	100,000,000	8	2 Q.	Feb., 1910
Railway Stl. Spring	44	—1	Mar. 3	13,500,000	2	1 S. A.	Oct., 1908
Railway Stl. Spring, pr	107	.....		13,500,000	7 cum.	1¾ Q.	Mar., 1910
Rep. Iron & Steel	39	—1	Oct. 19	27,191,000		.....	
Rep. Iron & Steel, pr	101⅜	.....		20,416,900	7 cum.	1¾ Q.	Apr., 1910
Sloss Sheffield	78	—1	Mar. 9	10,000,000	5	2 Q.†	Feb., 1910
Sloss-Sheffield pr	120	.....		6,700 000	7 n. c.	1¾ Q.	Feb., 1910
U. S. Pipe & Fdy. Co	24½	—2	June 22	12,106,300	2	1 Q.	
U. S. Pipe & Fdy. Co., pr	76	—2½		12,106,300	7 n. c.	1¾ Q.	
U. S. Steel	85¼	.....	April 18	508,302,500	4 n. c.	1¾‡ Q.	Oct., 1909
U. S. Steel, pr	121⅜	— ⅜		360,281,100	7 cum.	1¾ Q.	Oct., 1909
U. S. Steel 5s	105	— ⅛		463,798,000	5	.....	Jan., 1910
Va. Iron, Coal & Coke	62¾	.....	Sept. 20	9,073,680		.....	Mar., 1910
Westinghouse Elec	71	—2	July 27	27,173,200*		1¾ Q.	Mar., 1910
Westinghouse Air Brake	148	+1	Oct. 4	14,000,000*		5 Q.	Apr., 1910

†Includes deferred dividend of ¾ of 1 per cent.
Par value of shares $100, except those starred (*), $50.
‡Includes ¼ per cent extra.

Failures during the week numbered 247 against 239 the week before, and 249 the corresponding week of a year ago. Liabilities in failures during March, up to March 19, were $7,409,378, against $5,881,623 for the same period a year ago. The number of shares sold on the New York exchange was 3,762,600, against 4,473,750 the week before and 2,630,920 for the corresponding week of 1909. Bonds other than government bonds sold to the value of $14,356,000, against $19,534,000 the week before, and $16,039,000 for the corresponding week of a year ago.

Copper.

New York.—Amalgamated Copper closed 78⅛, a loss of ¾.

Boston.—Butte Coalition closed 25⅜, unchanged; Calumet & Arizona closed 73, a loss of 1; Calumet & Hecla closed 620, a loss of 10; North Butte Mining closed 42⅛, a gain of 1⅛; Quincy Mining closed 88, a loss of 2.

Financial Notes.

The Crucible Steel Co. has declared the regular quarterly dividend of 1¾ per cent on preferred stock, payable March 31. No action was taken looking to the payment of accumulated dividends.

The United States Smelting & Refining Co. has declared the regular quarterly dividend of 1 per cent on common, and 1¾ per cent on preferred, payable April 15.

The Canadian Car & Foundry Co. has declared a dividend of 1¾ per cent on preferred stock, payable April 15.

THE IRON TRADE REVIEW

Devoted to Iron and Steel Manufacture and to the Machinery, Metal-Working and Foundry Trades.

PUBLISHED EVERY THURSDAY BY
THE PENTON PUBLISHING CO.
CLEVELAND.

BUFFALO.....932 Ellicott Sq.
CHICAGO.....1328 Monadnock Blk.
CINCINNATI....N. E. cor. Fourth and Elm.
NEW YORK.....1005 West Street Bldg.
PITTSBURG.....510 Park Bldg.
SEATTLE.....942 Henry Bldg.
WASHINGTON, D. C.....Post Bldg.

Subscription, United States and Mexico, $3.00 per annum. To Canada and Foreign Countries, $4.50. The price of copies issued three months or more previous to date of current issue will be 25 cents each. Advertising rates furnished on application.

Change of advertising copy must reach this office ten days preceding date of publication.

The Cleveland News Co. will supply THE IRON TRADE REVIEW through the regular channels of the American News Co.

European Agents: The International News Company, Breams Building, Chancery Lane, London, E. C., England.

ENTERED AT THE POST OFFICE AT CLEVELAND AS SECOND CLASS MATTER.

PRINTED IN AN OPEN SHOP.

COPYRIGHT 1910 BY PENTON PUBLISHING CO.

THE AVERAGE PAID CIRCULATION OF THE IRON TRADE REVIEW FOR THE ISSUES OF THE FOLLOWING MONTHS WAS:

March, 1909	5,396
April	5,508
May	5,533
June	5,551
July	5,572
August	5,597
September	5,609
October	5,628
November	5,634
December	5,662
January, 1910	5.681
February	5,703

March 24, 1910

THE FUTURE OF THE COPPER MARKET.

Last week's figures of the Copper Producers' Association were called "disappointing" by the financial press. The idea of the speculating contingent is, apparently, that new records must be made each month. Unless a new "top" is reached there is retrogression, according to their logic. The figures for January were decidedly the best that had been issued up to that time, and for February, the returns of domestic deliveries were nearly as good. This is no reason, however, why copper should bound upward to 15 cents, as many seemed to expect. The chief difficulty in the copper market, past, present and probably in the future, lies in the mixing of speculation in copper mining shares and buying of the metal. The troubles of the market today are largely summed up under one head,—over production. This is the direct result of the high prices in 1906 and 1907, which stimulated the opening of copper mines wherever a trace of ore could be found. It usually requires two or three years to develop a copper mine; but these commenced to produce about the time, and shortly after, the bottom dropped out of the market. The owners of many mines continued to operate at a loss of a cent or two a pound in hope of a better market for copper or mining stock. These facts, seemingly irrelevant, are having an important bearing on copper prices today. It is admitted that many properties can make a profit, for their owners, at prevailing prices, but not all. Consumption is increasing, but is the price of copper to advance? A little study of statistics may throw some light on the subject.

The Copper Producers' Association has now been compiling figures of the production and consumption of copper for 14 months. As copper buyers come into the market three or four times a year and purchase enough metal to last for several weeks, the monthly figures of consumption, more properly called deliveries in the report, are somewhat misleading. By adding the deliveries each quarter and reducing this to daily deliveries, a better idea can be gained of the actual consumption. The average daily domestic deliveries have been as follows: First quarter, 1909, 1,603,474 pounds; second quarter, 1,860,434 pounds; third quarter, 2,035,211 pounds; fourth quarter, 2,249,315 pounds. For the first two months of 1910, the daily rate was 2,453,837 pounds. Surely no one could ask for a steadier and more conservative gain, especially when it reflected, as it did, the increased trade in finished lines. The total apparent consumption,—deliveries,—in 1909, was 703,589,593 pounds. In the boom year, 1906, they were 682,000,000 pounds. This indicates that some of the deliveries last year were speculative purchases. A careful estimate made recently by a well-informed representative of a London and continental house placed the melting of American copper in Europe at not to exceed 20,000 gross tons, or 44,800,000 pounds monthly. Production here could easily foot up to 130,000,000 pounds monthly, and this would leave for American consumption 76,000,000 pounds monthly. This figure was exceeded in January, but last month's figures were slightly less. In other words, deliveries are now equal to production; assuming that the deliveries made are all for actual melting. Can this be kept up and how long will the surplus of 107,000,000 pounds last? Probably not long if Europe should continue to absorb American supplies as it has in the last two years. Foreign visible supplies, however, are now 254,150,450 pounds, compared with 122,357,266 pounds on Jan. 1, 1909. What the visible supplies are, either here or abroad, are questions that the producers do not like to discuss. Invisible supplies are easily half the visible and it will take many months to absorb them, so that copper prices may be expected to keep considerably below 15 cents, for a year at least.

THE STEEL CORPORATION REPORT.

The financial statement of 1909 operations, as given in the United States Steel Corporation's full report for the year, and printed in our last issue, does not differ matrially from the statement compiled from the quarterly reports and given in our issue of Feb. 3. The earnings, as slightly revised, amounted to $131,491,414, making the year fall just below 1902, but pass 1903, 1904, 1905 and 1908. The maximum earnings were in 1907, $160,964,674.

After the usual fund provisions, interest, dividends, etc., there was left $33,521,918, of which $18,200,000 was specially appropriated, passing $15,321,918 to surplus. The $18,200,000 was made up of $10,000,000 for various purposes not specifically mentioned, $5,000,000 for the Gary plant, and $3,200,000 "for reserve

fund to cover advanced mining royalties." This latter is a new reservation in the annual earnings statements. In recent balance sheets, there has been a deduction from "deferred charges to operations" on the asset side, this deduction having grown in the balance sheet of Dec. 31, 1908, to $2,800,000, called "fund reserved from surplus to cover possible failure to realize advanced mining royalties." The payments on the Hill lease have become of importance, since the minimum for 1909 was 2,250,000 tons, at 91.8 cents a ton, this being the base rate of 85 cents plus two annual accretions of 3.4 cents, so that the royalty payment for 1909 would amount to a trifle over $2,000,000. In substance, the Corporation obtains nearly 4 per cent interest on such payments, for they prepay royalty on ore which will doubtless be mined in the future, when the current royalty will be higher. Thus, if the Corporation pays, at the close of 1909, for a ton of ore at the 1909 rate of 91.8 cents, and actually mines the ton in 1911, it has paid 91.8 cents two years in advance, but if it had to pay for the ton in 1911, the rate would be 98.6 cents, so that it saves 6.8 cents, this being 4 per cent for two years on 85 cents, and nearly 4 per cent on the 91.8 cents actually paid in advance.

The Steel Corporation's output of iron and steel products for sale, meaning that the products are weighed in the form in which they pass from the control of any subsidiary to an outsider, has been as follows, compared with the earnings:

	Earnings.	Production.
1902	$133,308,764	8,033,556
1903	109,171,152	7,458,879
1904	73,176,522	6,792,780
1905	119,787,658	9,226,386
1906	156,624,273	10,578,433
1907	160,964,674	10,376,742
1908	91,847,711	6,206,932
1909	131,491,414	9,859,660

The production of pig iron in the United States in the three big years has been:

1906	25,307,191
1907	25,781,361
1909	25,795,471

The Steel Corporation's output of products for sale has been in the reverse order, 1907 being the best of the three years, and 1909 the worst, although the variation in the country's pig iron production, and in the Steel Corporation's output, has been slight.

On account of slightly average higher prices in 1907 than in 1906, more by reason of the expiration of old contracts than by actual advances in open market quotations, the Corporation's average earnings per ton in 1907 were larger than in 1906, so that earnings were slightly larger, although the tonnage was slightly smaller. In 1907, the earnings per ton, derived from the figures in the above table, amounted to $15.51; in 1908 they were $14.80, and in 1909 they were $13.34. The very small decrease from 1907 to 1908 is noteworthy, for it is a fact that most finished steel products did show a market decline, while there was a material decline in prices realized on scale contracts, on account of the decline in pig iron, the average of the twelve monthly averages of Bessemer pig iron being $21.74 for 1907 and $16.14 for 1908. Then, too, there is usually an increased manufacturing cost when operations are at less than full capacity. Apparently these influences were largely offset by the complete closing, in 1908, of the least economical plants, and a change in the character of output, whereby there was a larger percentage of the more finished, and therefore more profitable, materials.

The bulk of the 1909 output was sold at greatly reduced prices, and average earnings of $13.34 per ton in the year, against $15.51 in 1907, must be regarded as very satisfactory. The computations are per gross ton, so that the reduction was just under $2 per net ton. The results are clearly better than would have been expected in the circumstances.

Taking the basic open-hearth steel industry of the country as a whole, the production of steel ingots has always greatly exceeded the production of basic pig iron, on account of the use of scrap, largely new material, but also, to a large extent, old material from the market. The Steel Corporation, however, does not show a corresponding gain in its ingot output, relative to pig iron, as it increased its basic open-hearth steel operations and decreased its Bessemer steel output. From 1906 to 1909, it decreased its production of Bessemer ingots by considerably more than 2,000,000 tons, and increased its production of open-hearth ingots by almost as much, making a decrease of about 150,000 tons in its total ingot production. Its pig iron production at the same time actually increased 350,000 tons in the same time, so that in 1909 it made 500,000 tons more pig iron, in relation to steel ingots, than in 1906, whereas on account of the decrease in Bessemer and increase in open-hearth one would have expected the variation to be in the other direction. The Corporation's pig iron purchases in 1906 were not large and would not materially affect the comparison. It is evident that the Corporation does not gain any large tonnage of steel output through the use of outside scrap. Of course its ingot production is much larger than its pig iron production, just as it is much larger than its production of finished steel. That is merely an incident of the process of manufacture, for a certain percentage of the ingot as weighed goes back through the steel making process, not appearing as finished material for shipment until it has gone over the ingot scale again.

This feature is well brought out by the detailed statement as to operations at the Gary plant. In the annual report for 1907, the portion of the Gary plant to be built at once was described as comprising eight blast furnaces and 56 60-ton open-hearth furnaces, indicating an output of 1,200,000 tons a year of pig iron and 2,700,000 tons of steel ingots, with the expectation that ultimately the plant would be increased to 16 blast furnaces, with a corresponding increase in the open-hearth furnaces. From these data it was figured in some quarters that the Gary plant would be an enormous consumer of market scrap, and Chicago dealers accumulated a tonnage of scrap which was very large in relation to the market, but would have lasted the Gary plant but a short time had the theory of the dealers been carried out. The production at Gary in 1909 showed a slightly smaller tonnage of ingots than of pig iron, and, of course, a still smaller tonnage of finished steel. The figures are given as follows:

Pig iron	519,197
Steel ingots	511,601
Steel rails	324,856
Billet and merchant mill products	73,480
All steel for sale	398,336

The Steel Corporation's production of pig iron, Bessemer and open-hearth steel

	Pig Iron.	Bessemer Ingots.	Open-hearth Ingots.	Total Ingots.	Products for Sale.
1906	11,267,377	8,072,655	5,438,409	13,511,149	10,578,433
1907	10,819,968	7,556,460	5,543,088	13,099,548	10,376,742
1908	6,934,408	4,056,275	3,783,438	7,838,713	6,206,932
1909	11,618,350	5,846,300	7,508,889	13,353,189	9,859,660

ingots, and finished products for sale in the past four years is given in the accompanying table. In 1909, the 5,846,300 tons of Bessemer ingots, allowing about 10 per cent for waste, would have required about 6,400,000 tons of pig iron, leaving about 5,200,000 tons of pig iron for the 7,500,000 tons of open-hearth steel ingots, or about two tons of pig iron for one ton of scrap. Deducting the pig iron from ingots leaves 2,300,000 tons of scrap, which would be about 17 per cent of the total steel ingot output, about the normal scrap production in rolling. These figures, of course, are only rough approximations, for at detached Bessemer plants a considerable quantity of scrap may possibly be used. As a rule, the Bessemer scrap is diverted to the open-hearth furnaces as much as possible.

BARS FROM SCRAP

Being Rolled for Steel Market by Eastern Iron Makers.

New York, March 21.

Arising from the high prices being asked by steel makers for billets, particularly open-hearth, an interesting procedure of buying has developed in the eastern scrap market by those users who are attempting to compete in finished lines with the makers consuming their own steel. Due to the slackness of bar iron demand that has ruled in the east for several years past in favor of steel bars, a number of the iron mills, as previously reported, are rolling steel bars from material purchased in the open market and are asking from 1.60c to 1.65c, mill, for this product. This activity is limited, however, by the opportunities of the buying mill to purchase its semi-finished steel at favorable prices for the conversion into bars. Steel billet prices being strongly held at high levels and material being actually scarce in some cases, these iron mills have turned to the scrap market to help them out of their difficulty. As a result, some of them are now purchasing scrap steel shafting which is being cut to lengths, reheated and rolled into bar material. This grade of scrap is purchasable at about $18 to $19 per gross ton at eastern tidewater, which compares most favorably with $30, mill, being asked by eastern sellers of open-hearth billets. Furthermore, the claim is advanced that because of its previous rolling and drawing into shafting form, the material is of superior quality for bar purposes.

STEADY PROGRESS

Of Youngstown Sheet & Tube Co.—Visit From Pipe Jobbers.

Within the next 30 days, the Youngstown Sheet & Tube Co. will have its new lap weld pipe furnace and mills ready for operation to manufacture Bessemer steel pipe in sizes from 10 to 20 inches, outside diameter. About the same time, the eight new sheet mills will be ready for operation. In addition to these improvements and additions, the puddling department has been increased about 50 per cent during the past year, making a total puddling capacity equal to 50 single furnaces. The frame buildings about the puddling fires will be torn down and steel structures erected.

On Thursday of last week, a special Pullman carload of representative jobbers from all parts of the country, in Pittsburg attending the annual convention of the National Association of Jobbers of Wrought Pipe and Fittings, went to Youngstown as guests of the Youngstown Sheet & Tube Co., to inspect the plant. During the course of the inspection, which consumed the entire day, including a noon-day lunch at the works and dinner at the Youngstown Club in the evening, the wonderful growth of the company since its start eight years ago was pointed out.

The original installation in 1902 consisted of six sheet mills, three pipe mills, one a lap weld up to 8 inches and two butt weld and a skelp mill. The capitalization at that time was $600,000.

Today the company has a capitalization of $10,000,000, a surplus of $7,000,000, and the proceeds of a $3,200,000 bond issue, making an investment of over $20,000,000, of which $15,000,000 is invested in plant account and the remainder in ore and coal properties and working capital.

The plant at present consists of two 500-ton blast furnaces in operation and one building which will be completed July 1; two Bessemer converters and a steel works with a total capacity of 50,000 tons of semi-finished steel per month; 14 sheet mills with a monthly capacity of 6,000 tons; a new galvanizing plant with a capacity of 5,000 tons of galvanized sheets per month; three skelp mills and 10 pipe mills. There are four lap weld and six butt weld furnaces. The skelp mills are capable of producing 30,000 tons per month. The pipe mills have a full range up to 20-inch, outside diameter, pipe, and a capacity from 25,000 to 30,000 tons per month.

A new fence factory and warehouse for manufacturing and storing square and diamond mesh fence is in course of construction. The present foundry building is to be abandoned and the general machine shop, which is in one end of the building, will occupy the whole structure. A new foundry building will be erected some time during the year, and in the pipe department the threading and coupling shops are to be increased to keep pace with the new capacity of the mills, and in the sheet department the corrugating and painting shops are to be remodeled into a warehouse and these two branches of the business given new quarters. A new laboratory is also to be built.

The company recently purchased 70 acres of land to the west and across the river from its present holdings and in order to join the properties and make them continuous, the bed of the Mahoning river is to be moved one-quarter of a mile to the south and its course changed for a distance of three-fourths of a mile. The company is now building a dam at the lower end of its holdings and by so doing creating a reservoir for water supply. Additions to the pumping plant giving it a capacity of 105,000,000 gallons per day to meet the requirements for several years to come has been installed.

EASTERN STRIKE TROUBLES SHOW IMPROVEMENT.

Some clearing up of the strike troubles in eastern Pennsylvania which have, in a measure, adversely affected sentiment in the iron and steel market in that locality, is to be noted. At South Bethlehem, it was stated recently that about 6,000 men of the Bethlehem Steel Co. are at work, which represented about three-fourths of the normal day force. The company reports that it is now operating its plant to better advantage than at any time since the strike. Some of the molders in the foundries of Philadelphia and immediate vicinity, who went out at the call of the general sympathy strike, have gone back to their posts, and conditions are more promising for the steady activity of shops. Several thousand of the men of the Baldwin Locomotive Works have been induced to join the strikers' cause although the plant has been an open shop up to this time. The extensive operations of the Baldwin works have been little affected by the withdrawal of the men.

PULLMAN PLANT

FOR PASSENGER AND FREIGHT CAR MANUFACTURE

Is Now Nearing Completion — Work Was Begun in 1908 on Shops for Making Steel Cars— Much Has Been Accomplished.

The new and extensive plant of the Pullman Co., at Pullman, Ill., for the manufacture of cars, both passenger and freight, which has been in course of construction for over a year, is nearing completion, and THE IRON TRADE REVIEW is enabled to give the following particulars of the buildings and the machinery to be installed in them.

The construction of the passenger steel car shop was commenced in October, 1908, and the main building, comprising machine and construction shops, completed in January, 1909. The shop was of irregular shape, covering 101,000 square feet of ground space. This first building was followed by two other buildings completed in the summer of 1909, each being 250 by 450 feet, and, combined, covering 255,000 square feet of ground space.

These shops were equipped with electric motor-driven machines comprising shears, multiple punches, planers, bull dozers, riveters, presses, etc. The main building is also equipped with two overhead traveling cranes with a capacity of 20 tons each. All new buildings were of steel, brick and concrete construction and fireproof.

The present output of the passenger steel car shop is two steel sleepers and five steel ordinary coaches per day.

These shops above referred to are in addition to the old plant for the construction of wooden passenger and freight cars, with a capacity of 100 wooden sleepers and coaches per month and 2,500 wooden freight cars per month. The passenger plant covers 300 acres; total number of men employed, 9,500.

The construction of the new plant for the building of steel freight cars is now well under way and is situated on the land bounded by the Illinois Central railroad on the west, the Pullman railroad on the east, 100th street on the north and 103rd street on the south, in all comprising about 140 acres.

All of the buildings run east and west and comprise a main car building shop 1,200 by 400 feet, a wheel and axle department, 360 by 90 feet, a power house and machine shop combined, 500 by 80 feet, and a waste storage building, 65 by 30 feet.

In addition to these, two oil-storage vaults for fuel and car oils will be built underground, and two outside crane runways, on which will operate 10-ton electric cranes, will be erected adjacent to the main car building shop and the wheel and axle department, the one for unloading the steel plates and structural shapes from the cars as they are received from the steel mills and storing them in the steel yard, and in turn, loading them as required on push cars to be delivered to the various departments for fabrication into car material; the other for unloading the billets from which axles are made in the wheel and axle department, and then unloading them again on push cars as required, to be sent to the axle furnaces.

Within the enclosure of the new plant will be laid 7½ miles of standard track, which includes a belt line completely around the plant, to facilitate the delivery of material to any department, or for quick and easy access to any part of the plant.

The main car-building shop will have four aisles 1,200 feet long and 90 feet wide, and a lean-to 25 feet wide extending the full length of the building, and in the latter will be located the offices for the various departments, tool rooms, lavatories, store rooms, etc. In the four aisles of this main building will be the various departments, namely, shearing, punching, pressing, riveting, erecting, air brake, painting, rivet making, truck building, inspection and testing.

To serve these various departments there will be installed 11 10-ton overhead electric traveling cranes, and two transfer trucks with electrically operated 10-ton capacity cars for transferring material from one aisle to another. All the shearing and punching machinery in this shop will be driven by electric motors, alternating current, three-phase, 60-cycle, 440 volts. All the machinery for pressing and riveting will be hydraulically driven.

All of the furnaces will be oil-fired, the blast being obtained from electrically driven fans through blast pipes laid in open conduits in the floor. All electric transmission lines, oil pipe lines, air pipe lines, water and hydraulic pipe lines will be carried through an underground tunnel 7 feet high and varying in width from 4 to 7 feet, thus doing away with any overhead wiring or piping and giving easy access for inspection and repairs.

The wheel and axle shop will contain the necessary axle hammers, furnaces, axle lathes, wheel borers and wheel presses to meet the demands of the car-building department, and will be served by an overhead electric traveling crane of 10 tons capacity.

The waste storage building will contain the necessary oil pumps and other apparatus for properly soaking the waste with oil before being placed in the journal boxes of the car trucks, in addition to being of sufficient size to properly house an adequate supply of waste at all times.

The combined power house and machine shop will be divided into five rooms; at the east end will be the boiler room; adjoining that will be the engine room, then the electrical department, then a blacksmith shop and at the west end the machine shop. The boiler room will contain three double batteries of water tube boilers with superheaters, with a total capacity of 2,400 horsepower, the necessary coal and ash-handling machinery, the boiler feed pumps and the heaters. Adjacent to this room will be the smoke stack built of brick, 12 feet inside diameter and 250 feet high. The engine room will contain two 100-kilowatt horizontal steam turbines, with exciters and condensing outfits, one high-duty Corliss hydraulic pump of 500 gallons capacity operating against a pressure of 1,000 pounds per square inch, and two Corliss cross-compound air compressors, each with a capacity of 4,000 cubic feet of free air per minute, and in addition will be the necessary hydraulic accumulators, air receivers, switchboard, rotary converter and overhead electric traveling crane.

The electric department will contain the necessary tools and appliances for maintaining the electrical equipment of the plant as well as being used as a storage for electrical materials. The blacksmith and machine shops will be thoroughly equipped with machinery, tools, etc., for the proper maintenance of the machinery in the car building department, and for making small tools, dies, formers, etc., in connection with the work in those departments.

All buildings will be connected with the underground tunnel previously referred to, which will be nearly 1½ miles long, and it will be possible to walk from one building to the other without coming to the surface in inclement weather.

ANNUAL REPORT SHOWS GIANT SIZE OF STEEL CORPORATION

The annual report of the United States Steel Corporation, which was summarized in our last week's issue, contains a vast amount of general information in respect to the company which could not be referred to in our first article owing to lack of space and time.

The report comprises 55 pages, mostly statistical matter, which strikingly reveals the immense extent of the activities of that giant corporation. The condensed general balance sheet shows a total of $1,500,092,134.63 in the general property account, which, with $291,018,166.95 in current assets and other smaller credits, makes the total assets of the company $1,821,965,555.42. The gross earnings of the company for 1909 were $646,382,251. This sum is the aggregate gross value of all the commercial transactions conducted by the several subsidiary companies, and includes sales made between subsidiary companies, the gross receipts of the transportation companies for service rendered both to the subsidiary companies and to the general public. The earnings for the year resulting from the above gross business represent the combined profits accruing to the several corporate interests on their respective sales and services rendered, each of which is in itself a complete commercial transaction. The following table shows the manner in which the $131,491,414 of net earnings referred to in our last week's article were acquired. Comparison is made with the preceding year:

	1909	1908.
Gross sales and earn.	$646,382,251	$482,307,840
Mfg. prod., op. exp.	†483,417,842	367,735,102
Balance	$162,964,409	$114,572,738
Misc. income	3,385,382	1,488,805
Total mfg. income	$166,349,791	$116,061,543
Other income	3,432,617	4,298,080
Total income	$169,782,408	$120,359,623
General expenses	27,786,420	$21,001,037
Balance	$141,995,988	$ 99,358,586
Interest charges	7,887,178	7,401,205
Balance	$134,108,809	$ 91,957,381
‡Less earnings	2,617,395	109,670
Net earnings	$131,491,414	$ 91,847,711

† Includes charges for ordinary maintenance and repairs, approximately $35,000,000.

‡ Less earnings of subsidiary companies of which profits have not yet been realized in cash.

Pay Roll and Inventory.

Carried on the payrolls of the Corporation for the year were an average of 195,500 employes, as compared with 165,211 the year before. The annual payroll of salaries and wages was $151,663,394, against $120,510,829 in 1908. The employes were distributed as follows: In manufacturing properties, 138,865; in the coal and coke properties, 21,867; the iron ore properties, 15,077; transportation properties, 17,104, and in miscellaneous properties, 2,587.

The corporation's inventory contains a number of items of interest. The total is $163,811,280, of which the single item of iron ore takes up $67,692,137. The corporation explains that this item covers the ore in stock piles at the mines, docks at lower lake ports, and at the furnaces. This valuation for the iron ore is only 2.9 per cent greater than the value at the close of the preceding year, but it is inventoried at a lower price and represents a tonnage of about 10 per cent greater than that carried at the end of 1908. At the close of the year, the company had on hand in non-ferrous metals property valued at $8,802,651; manufacturing supplies, stores, and various other items classified together with a value of $12,546,256; finished products at $26,776,337, and blooms, billets, slabs and like material are inventoried at $9,096,901. The total of the inventory for 1909 is about $20,000,000 greater than for 1908.

Plants of Subsidiaries.

A further idea of the magnitude of the company's operations may be gained from a summary of the manufacturing plants controlled by the subsidiaries. The total number of blast furnaces is 127; Bessemer converters, 35; open-hearth furnaces, 254; blooming, billet and slab mills, 43; small billet or sheet bar mills, 14; rail mills, 9; hot mills and black plate mills for tinning, 235; and the total number of works owned by the corporation is 143. The corporation owns or controls 77 iron ore mines in the Lake Superior region and 21 in Alabama and Georgia. It owns 898.33 miles of main line standard gage road; 557.35 miles of branches and spurs; operates 458.26 miles under trackage rights; has 321.58 miles of second track, and 824.11 miles of siding. It also controls 75 steamers on the Great Lakes, 22 barges and two tugs, beside 90 barges and two steamers on the Ohio river.

The corporation's coal and coke properties in the Connellsville region comprise 56,991 acres of coking coal owned by the corporation, and 1,367 acres leased. It operates 64 coke plants in the region, comprising 20,933 bee-hive ovens. It also operates six coal plants in the Connellsville region, but not in connection with its coking plants. In the Pocahontas region, the corporation has leasehold rights to 65,133 acres, eight coke plants, and 2,151 bee-hive ovens. The corporation controls steam coal properties amounting to 23,180 acres owned and 3,952 leased in eight counties in Pennsylvania and 3,227 acres in various small tracts in Ohio, Pennsylvania and West Virginia, and 3,742 acres in Sullivan county, Ind., and Williamson county, Ill. In addition to the bee-hive ovens, the company has a total of 612 by-product ovens. The total acreage owned and leased in coke properties is 123,491, and in steam coal properties, 34,241.

In discussing the corporation's coal properties, President Corey and Chairman Gary say that the increasing requirements for coal of the subsidiary companies having plants in the Chicago district, and their inability to obtain the necessary quantities of coal of

Month.	EARNINGS FROM JAN. 1, 1905, TO DEC. 31, 1909. 1905.	1906.	1907.	1908.	1909.
January	$ 6,810,846.88	$11,856,375.42	$12,838,703.25	$ 5,052,743.24	$ 7,262,605.62
February	6,629,462.87	10,958,275.20	12,145,814.95	5,709,427.64	7,669,335.70
March	9,585,585.87	13,819,839.50	14,137,973.85	7,466,834.23	7,989,327.43
First quarter	$23,025,895.62	$36,634,490.12	$39,122,492.05	$18,229,005.11	$22,921,268.75
April	$ 9,037,924.69	$12,581,901.80	$14,600,837.97	$ 6,761,680.59	$ 8,163,244.48
May	10,602,187.27	14,041,601.28	16,056,832.06	6,021,278.73	9,661,227.76
June	10,665,004.46	13,501,529.84	14,846,034.82	7,482,796.54	11,516,019.38
Second quarter	$30,305,116.42	$40,125,032.92	$45,503,704.85	$20,265,755.86	$29,340,491.62
July	$ 9,035,168.49	$12,242,098.07	$13,804,167.34	$ 8,599,630.15	$12,530,769.84
August	10,986,901.02	13,158,860.10	15,279,172.67	9,152,311.13	12,437,754.28
September	11,218,513.43	12,713,666.08	14,720,945.15	9,354,333.42	13,278,383.31
Third quarter	$31,240,582.94	$38,114,624.25	$43,804,285.16	$27,106,274.70	$38,246,907.43
October	$12,400,306.52	$14,984,925.75	$17,052,210.70	$ 9,415,667.63	$14,048,205.13
November	11,827,214.98	13,482,464.58	10,467,252.60	8,756,728.90	13,711,764.67
December	10,988,541.95	13,282,735.56	5,014,728.36	8,074,278.37	13,222,776.34
Fourth quarter	$35,216,063.45	$41,750,125.89	$32,534,191.66	$26,246,674.90	$40,982,746.14
Total for year	$119,787,658.43	$136,624,273.18	$160,964,673.72	$91,847,710.57	$131,491,413.94

good quality, have influenced the corporation to acquire considerable developed and undeveloped coal property in the Danville district, in Illinois, and the Clinton field, in Indiana. The sum expended for the purchase of these properties is not separately itemized, being included in the outlay upon capital account. Further details as to the corporation's coal operations in Indiana and Illinois will be presented in the 1910 report.

New Construction.

During the year, a large amount of new construction and improvement work was authorized. Some of the items mentioned by Chairman Gary and President Corey are a new blast furnace at the Cleveland plant of the American Steel & Wire Co., a new light structural mill at the South Works of the Illinois Steel Co., and an extension of the cement plant at Buffington, Ind., which will increase its capacity to the amount of 2,000,000 barrels annually, bringing the Universal Portland Cement Co.'s capacity up to 10,000,000 barrels annually. The American Steel & Wire Co. has authorized the construction of a rod mill and wire plant at Birmingham, Ala., having a capacity of 400 tons of finished product per day, and the Tennessee Coal, Iron & Railroad Co. will construct two additional open-hearth furnaces and a power plant to supply steel for the rod and wire mill just mentioned. The Tennessee Coal, Iron & Railroad Co. is also building a by-product coke plant to consist of 280 ovens. During the year, the Tennessee company has acquired 1,800 acres available for manufacturing sites, 1,300 acres for a water reservoir, and upwards of 900 acres to be used in connection with its mining operations. Subsidiaries of the corporation have ordered for 1910 delivery 53 locomotives, 4,900 steel cars and five ore carrying steamers, each with a cargo capacity of 12,000 tons.

Gary Plants.

Improvements for the year at Gary included the completion of four blast furnaces, making the total of six in operation there at the end of the year; 28 open-hearth steel furnaces, a heavy rail mill and blooming and large billet mill, and an 18-inch bar mill. It is expected that by April, 1910, two more blast furnaces, a car axle plant and a 14-inch merchant bar mill will be ready, and in July of the same year, 14 additional open-hearth furnaces are expected to be completed. In August it is hoped to have the 60-inch universal plate mill, and the 10-inch and two 12-inch merchant bar mills completed. Construction was commenced during the year on a by-product coke plant, which is to consist of 560 ovens of the Koppers type. This plant will have a normal capacity of 1,900,000 net tons of coke, which will be sufficient to supply the annual requirements of 12 blast furnaces. The first battery of 70 ovens will be in operation by September, 1910.

The report by the chairman and president also mentions the projected plant to be built at Gary by the American Sheet & Tin Plate Co., which is to comprise two 72-inch plate mills; four jobbing mills, a 16-inch sheet mill, together with a galvanizing plant. Work on this plant is to commence in April, 1910, and when complete, it will have an annual capacity of 200,000 gross tons of plates and sheets. The American Bridge Co. has authorized the construction at Gary of a bridge and structural plant which will have an annual capacity of 120,000 tons of fabricated structural material. Both of these concerns will receive their steel from the Gary plant of the Indiana Steel Co. During the year, the Gary plant produced 519,197 tons of pig iron; 511,601 tons of open hearth steel ingots, 324,856 tons of open hearth steel rails, 73,480 tons of billets and merchant mill products, and 6,862 tons of foundry products.

The corporation expended upon current repairs and maintenance during the year $34,002,389, and for extraordinary replacements, $8,514,716, and in that connection, Chairman Gary and President Corey say that the physical condition of the properties at the close of the year was excellent.

GOOD PROFITS

Shown in Report of Crucible Steel Co. of America—Regular Dividend.

Directors of the Crucible Steel Co of America have declared the regular quarterly dividend of 1¾ per cent on the preferred stock, payable March 31 to holders of record March 31.

Chairman DuPuy stated that, although the quarter ending Feb. 28 1910, was the shortest quarter of the year, and included the holidays as well, yet the operating profits, as compared with those of the previous quarter, were practically the same.

Orders have kept up well and shipments show no diminution. The demand for the company's products has been so urgent that the management has recently been compelled to reopen the Aliquippa, Pa., plant, which has not been in operation for a number of years. With these works in operation, every available plant owned by the company is actively producing.

During the quarter just ended, a number of permanent improvements have been made at several of the company's works with a view of economy in operation. These are now effective and have begun to show results. A number of important additions are now under construction at the Atha and Park plants of the company, which, it is expected, will show a great saving in productive costs during the next few months.

The statement presented, covering the half-year ending Feb. 28, shows as follows:

PROFITS.

Quarter ending Nov. 30, 1909		$1,410,905.70
Quarter ending Feb. 28, 1910		1,406,361.03
		$2,817,266.73
Deduct charges and appropriations for the following purposes, viz.:		
Depreciation and repairs	$625,520.09	
	65,943.50	
		$ 691,463.59
Net profits		$2,125,803.14
Surplus, Feb. 28, 1910		$4,489,616.08
Surplus, Feb. 28, 1909		2,640,589.67
Increase		$1,849,026.41

Analyzing this statement, the profits for the quarter ending Feb. 28, 1910, as compared with the corresponding quarter of 1909, show an increase of $850,537.64, while the net profits for the six months just ended, namely, $2,125,803.14, compared with the corresponding period of 1909, $947,695.40, show an increase of $1,178,107.74. The net earnings of the past six months are at the rate of 17 per cent per annum on the preferred stock.

The physical condition of the company's plants has been improved and has been maintained to the highest state of excellence. All costs of depreciation, renewals and repairs have been taken out of earnings before the determination of profits.

The present surplus of $4,489,616.08 is equal to about 18 per cent on the preferred stock.

COAL AND COKE TONNAGE.

The statement showing the amount of coal and coke in tons carried on the Pennsylvania railway lines east of Pittsburg and Erie for February, is as follows.

		Increase
Anthracite	900,130	123,494
Bituminous	3,631,361	846,913
Coke	1,241,144	447,493
Total	5,772,635	1,417,900
For two months:—		
Anthracite	1,944,445	160,878
Bituminous	7,236,090	1,460,946
Coke	2,654,301	997,297
Total	11,834,836	2,619,121

AMONG MACHINERY MAKERS.

PITTSBURG.

March Business In Machinery Trades Making a Good Showing.

Office of THE IRON TRADE REVIEW,
510 Park Building, Mar. 22.

Machinery makers are now receiving requests for prompt shipment on all classes of machinery for which contracts were awarded some time ago. This is due to the fact that with the approach of warm weather preliminary work is being started on the construction of new plants and extensions to present works. As far as new business is concerned, the record for the month of March so far is probably greater than in February, and compares favorably with business booked during the initial month of the year. Contractors are asking bids for machinery, equipment, tools, etc., to be used in the iron and steel plants, building of bridges, extension of docks and other work which is to be rushed to completion. While contracts for a portion of the heavy machinery, which will be used in carrying out the 1910 construction program are being held up temporarily, it is expected that machinery makers will be asked to bid on some large contracts in the very near future. The machinery market is active, and there is enough tonnage on the books to keep practically all of the plants in this section in steady operation for some time.

It is expected that bids will be asked shortly for equipment to be installed in the two new sheet mills to be erected by the Follansbee Brothers' Co., at the Follansbee, W. Va., plant. Preliminary work on the additional sheet mills has already been started. This will make four sheet mills in the plant, in addition to the six tin mills.

The H. C. Frick Coke Co. is installing a 25-ton entry cutting machine at the Filbert shaft. The machine will cut from 8 to 12 feet wide and from 6 to 8 feet high. It is expected that the Frick company will build additional machines of this type at the Everson, Pa., car shops.

D. T. Riffle, of Pittsburg, has been awarded a contract to erect, for the Oscar Barnett Foundry Co., its new plant at Newark, N. J. The buildings, which will cost $70,000, exclusive of machinery, are to be arranged in a group, the total frontage of which will be 580 feet.

Members of the board of engineers of rivers and harbors will meet at Parkersburg, W. Va., March 29, to receive information that will aid them in deciding on the proposed improvement of the Little Kanawha river to the coal fields in Gilmer county, W. Va. The project includes a series of 13 or more dams, which, it is estimated, will cost $3,000,000.

The Chapman-Miller Co. is receiving bids for machinery and equipment to be used in the development of the Ritchie county, W. Va., oil lands purchased recently. Contracts have already been awarded for 11 new wells.

The Scott Roofing & Mfg. Co. is expected to enter the market shortly for machinery to be installed at the wire and nail plant at Beechwood, W. Va.

J. G. Gates, of Fairchance, Pa., has been awarded a contract for the completion of 28 ovens at the Garwood plant of the Dunlap-Connellsville Coke Co., near Brownsville, Pa.

Western Pennsylvania capitalists have disposed of their interests in the Osage reservation (Oklahoma) oil fields for $2,000,000. A. T. Fancher, of Oklahoma, and several other western capitalists now own the 28,000-acre tract, and are considering plans for the further development of this property.

The Pittsburg Coal, Dock & Wharf Co. has placed a contract with the Brown Hoisting Machinery Co. for the installation of mechanical appliances for the handling of coal shipped from Pittsburg to Duluth. The dock and wharf company is an underlying concern of the Pittsburg Coal Co. When this machinery is installed the company will have a capacity for handling 2,000,000 tons of bituminous coal. The order for this equipment involves an expenditure of approximately $500,000.

Bids have been received by the Baltimore & Ohio Southwestern Railroad Co. for new machinery to be installed at the Washington, Ind., shops, to cost about $61,000.

Several of the railroads have commenced buying machinery equipment, tools, etc., for shops and terminals. The Pennsylvania lines west of Pittsburg has placed an order with the Allis-Chalmers Co. for electric generating units to increase the capacity of the power plant on the Ft. Wayne system at Conway, Pa., below Pittsbug, from which current for operating the shops at that place, and also for railway signal work, is supplied. The new machinery consists of two 750-k. v. a., 3,600 r. p. m., 60-cycle, 3-phase, 2,300-volt steam turbo units. The turbines will receive steam at 145 pounds pressure and 100 degrees superheat. During the warm weather they will exhaust into a condenser in which a 28-inch vacuum is maintained. During cold weather, steam from the turbines will be used in heating the plant, and a maximum back pressure of about two pounds will be effective on the exhaust end.

Changes in the electrical equipment are being made at the Thurlow, Pa., shops of the American Steel Foundries Co., which is about to install a 200-kw. induction motor generator set. The alternating current side will receive 2,200-volt, 60-cycle, 2-phase current, while the output will be 250-volt direct current. The apparatus will be furnished by the Allis-Chalmers Co.

Plans are being prepared by the United States Glass Co., Pittsburg, for the enlargement of its plant at Glassport, Pa. This plant, which has been running steadily for 10 years, will be made the central factor of the country. Bids for machinery will be invited shortly.

It is expected that announcement of proposed extensions will be made following a special meeting of the stockholders of the Mahoning & Shenango Valley Railway & Light Co., which will be held May 16, to accept or reject a proposition to increase the capital stock of the company from $10,000,000 to $11,000,000.

Bids have been received by the Dilworth Coal Co., Pittsburg, on a washer and crusher to cost $65,000, which will be installed at the plant near Rices' Landing, Pa. The company also announces that work will be started within 90 days on 200 additional coke ovens.

Plans are now being prepared by the Steel Car & Forge Co., Ellwood City, Pa., for the erection of a new steel structure to replace one of the old buildings, and for other improvements to the company's plant.

Work is to be started in the near future by the Baltimore & Ohio Railroad Co. on proposed improvements at the Grafton, W. Va., yards, where approximately $750,000 will be expended. About 40,000 feet of new passenger and freight tracks, and 45,000 feet of new yard tracks will be laid. The company will also eliminate two or three small tunnels in West Virginia, and increase the capacity of

some of the West Virginia repair shops.

The Pittsburg Railways Co. has awarded a contract to the Pittsburg Valve, Foundry & Construction Co. for the necessary steam pipes for the monster turbines and generators being installed at the Brunots Island power plant. The contract amounts to about $50,000. More than $600,000 is being expended by the Railways Co. at Brunots Island to increase the power plant from 10,000 to 34,000 horsepower. One 3,000 and three 5,000-kilowatt 11,000-volt alternating current turbo-generators are being installed. The company is also erecting a new building, 485 x 180 feet.

Tests are being made by the Pressed Steel Car Co., Pittsburg, with a new 15-ton electric lifting magnet at its Woods Run plant. It is understood that the traveling crane equipment, at both Woods Run and McKees Rocks, will be replaced with new machinery of the magnet type, provided these tests are satisfactory. Between $20,000 and $30,000 are being expended by the company on new equipment for its axle-turning department.

NEW YORK.

Machine Tool Trade Somewhat Irregular—Automobile Buying.

Office of THE IRON TRADE REVIEW, Room 1005, No. 90 West St., Mar. 22.

Rather a spotty condition of trade is prevailing in the machine tool market, as shown by the reports of the leading selling houses of this city and the east. Some companies state that the month of March is bearing out every precedent in being normally probably the largest month for machine tool buying of the entire year, and that they are entering a volume of business which is comparing very favorably with corresponding periods in other full years. These sellers naturally are very well satisfied with the current conditions of trade and are very hopeful upon the future, as prospective business appears quite favorable. Other companies, however, during the past several weeks have experienced probably the least activity in orders placed since the first of the year and are a little perplexed over this development, although invariably the inquiry is fair and considerable negotiation is under way with good promise of some heavier buying to be done shortly.

From all advance indications which have reached sellers, the New York Central list, which is expected to appear in the near future, will be a large one. This is practically the only railroad business of any extent that is believed to be developing among eastern lines, but among large industrial buyers the outlook is that some good lists for shop maintenance needs will shortly be issued. One of these which is now expected is that of the Ingersoll-Rand Co., although no definite inquiries have yet been put out by it.

While the automobile demand for the current season's requirements appears to have been well satisfied by the strong buying which has been the leading feature of the machine tool market for some time, some notable purchasing is still being done by these interests and more is in prospect. Due to the delayed deliveries upon any assortment of tools of size, which would probably run six months from date, some of the automobile builders are giving early attention to next season's needs and will probably close without much delay. The Brush Automobile Co. has lately been buying a considerable number of tools for Detroit, dividing the business with different makers. The Locomobile Co. is also a prospective buyer of considerable extent.

The Overland Automobile Co., which recently acquired a manufacturing plant at Elmira, N. Y., is preparing to convert that property to its line of operations and will probably put out a large list of tools in the near future. The new plant will employ about 500 operatives.

Notwithstanding the fact that some builders have their shops very well filled and are having difficulty to make deliveries on the smaller sizes, there continues some sharp competition for crane business and a consequent shading of prices by certain companies which is making the situation practically a buyers' market. The general demand is good and the volume of bookings is favorable but with some exceptions builders are complying quite accurately with their promises of delivery. A notable crane award recently made was that for a 200-ton Shaw machine to be installed in the Conway, Pa., shops of the Pennsylvania railroad.

The Panama canal commission is asking prices on some machinery, including an engine 7 x 10 inches with a double cylinder, double-friction drum-hoist, one pump and gasoline engine, two pumps with 12-inch discharge and 14-inch suction direct-connected to individual motors, two portable pumps with a 3-inch discharge and 4-inch suction mounted upon trucks, and six push cars of extra heavy construction.

The Southern Equipment Co., 19 Young street, Houston, Tex., is in the market for a quantity of machine tools, either new or second hand, including a lathe about 48-inch swing, 10 feet between centers; lathe about 36-inch swing, 12 feet between centers; lathe about 18-inch swing, 8 or 9 feet between centers; lathe about 24-inch swing, 20 feet between centers; planer about 48-inch by 48-inch by 12 to 14 feet bed; radial drill press about 4 to 4½-foot arm; upright drill press about 36 to 40-inch arm; upright drill press about 20 to 24-inch arm; vertical boring and turning mill, about 12-inch swing; two Dallet portable drills; twist drill grinder; medium size key-seat cutter for pulleys and gears; horizontal milling machine equipped to cut gears up to 15 inches diameter; steam hammer about 1,200 to 1,500 pounds; horizontal boring mill for cylinders; two boring bars for horizontal mill; two crude oil heating furnaces; blower for furnaces; hydraulic wheel press; two blacksmith forge fires, good size; quantity of twist drills and reamers.

The Whittin Machine Works, Whittinville, Mass., is putting in the foundations for large additions to its shops. These include an extension of its blacksmith shop, 87 x 100 feet, and an addition to the foundry, 100 x 400 feet, which will increase the capacity of this department about 50 per cent. The plant of the Providence Machine Co., Providence, R. I., which was purchased last fall by the Whittin company, is to be moved to Whittinville by May 1, and the extensions are largely to accommodate this addition to the company's operations.

The eastern machinery trade is interested in the development of the plans of the Orson Automobile Co. recently chartered under the laws of New York by 100 prominent business men of New York and other cities to build automobiles for their own use after designs which represent a combination of the meritorious features of the various standard makes of cars. While the company at the start will probably build only 100 cars for its stockholders, the enterprise may develop into one of important commercial dimensions generally. The company is now figuring upon the establishment of a plant which will probably be located at Springfield, Mass., and the company is expected to shortly come into the market for a list of machine tools. Horace M.

Kilborn, vice president of the National City Bank, New York, is one of the originators and chief parties interested in the plan.

The Simonds Mfg. Co., Fitchburg, Mass., has purchased the land and buildings of the Simonds Rolling Machine Co. in that city which have not been occupied for manufacturing purposes. The property adjoins land of the Simonds Mfg. Co. and will be utilized by the purchaser in extending its facilities to meet the increased demand for its hardware specialties.

It is reported that the plant of the Duncannon Iron Co., Duncannon, Pa., which was recently purchased at receiver's sale by W. G. Lieper of Philadelphia, will be operated again. The sale price was $67,000. The plant is a historic one, having been originally erected in 1836, and after a fire in 1904 rebuilt. Its equipment consists of six rolling mills comprising two puddling and four finishing mills, 44 puddling furnaces and 50 cut nail machines. Its product has been bar iron and cut nails. A foundry and machine shop is connected with the plant.

CINCINNATI

General Feeling Improves—Various Sources of Demand.

Office of THE IRON TRADE REVIEW,
N. E. cor. Fourth and Elm Sts., Mar. 22.

With improved weather conditions, the general feeling is more optimistic, and builders of tools look for a prosperous year's work. Reports indicate that several of the larger railroad companies have been doing some buying of engines and cars, but this movement is apparently not general throughout the country, and comparatively speaking is far below what it should be at this season of the year. There is an important factor in the situation at this time that is making itself felt, and is causing considerable uneasiness along business and financial lines, that is the unsettled conditions and controversy now pending between the miners and coal operators. Daily conferences have been held in this city for the past week, and a settlement is apparently as remote at this time as at the beginning of the controversy. The next day or two will probably see some developments, looked forward to with considerable anxiety.

Builders of the smaller size of lathes say they are receiving orders from a number of country blacksmith shops, whose plants are being equipped as accessories to garages, and automobile repair shops generally. A number of these latter concerns are now under construction, and equipment is being secured to begin operations when ready. Builders of engines and boilers are finding an active market for their output on the Pacific coast, and the entire northwestern territory, as well as supplying the lumber interests throughout the south and west. One concern, in which Cincinnati capital is largely interested, The Casey, Hedges Co., of Chattanooga, Tenn, a $900,000 corporation, last month shipped to the Pacific coast, $65,000 worth of boilers, embracing various industries. Manufacturers of sugar mill machinery have been receiving considerable volume of trade from South American points, as well as from the island possessions of the United States.

The Rahn-Carpenter Co., builder of lathes, has recently made some changes in the personnel of its officers, Mr. Carpenter retiring from active service and Mr. Rahn assuming the duties of president. A. J. Larmon, son of the late Jas. Larmon, for many years connected with The Cincinnati Barbed Wire Fence Co., is treasurer of the company. Trade is said to be a little better, and inquiries and orders from eastern selling agents more active.

The Blymyer Co., manufacturer of sugar, coffee and rice mill machinery, is at the present time estimating on a large sugar mill outfit for the Philippine Islands. Demand has been good for other branches of the trade, from South America and Cuba, but has fallen off during the past month, as it is now between seasons.

The Willard Machine & Tool Co., which recently removed to its present quarters, is well equipped to handle the trade coming its way and demand for its lathes of 13 inches by 6 feet is said to be active, with prospects good for a satisfactory year.

The Ohio Welding & Mfg. Co., a new corporation which will be a subsidiary branch of the Davis-Bournonville Co., of New York., is to open a factory in this city at 828-830 West Sixth street. About 50 operatives will be employed by the concern.

The Straub Machine Tool Co., at Spring Grove avenue and Knowlton street, this city, is having plans drawn for a large factory building that will practically cover an acre of ground. This improvement will be 160 x 225 feet, of fireproof construction, two stories. As this section is occasionally disturbed by flood conditions, it is the intention to install the machine shop proper on the second floor. Switching facilities will be afforded by one of the railroads that pass through this section of the city.

The city of Dayton, O., has contracted with the United States Cast Iron Pipe & Foundry Co., at its bid of $14,456.25 for cast iron pipe for the water works department.

The Houston, Stanwood & Gamble Co., builders of engines and boilers, reports trade conditions more healthy, and demand much more general throughout the territory from which they draw trade. Sales show a gain of 50 per cent over the corresponding period of last year. In the line of large outfits that are now being furnished, are a pair of engines that will develop 700 horsepower, and six 150-horsepower boilers for the Thompson-Tucker Lumber Co., of Trinity, Tex. The Norfolk Lumber Co., of Wallace, N. C., will take two boilers of 150 horsepower and a 250-horsepower engine. Orders have been received for several carloads of engines and boilers to be shipped a little later to various points in Texas, to be used for cotton ginning purposes. Its representative at Vancouver, B. C., has been sent a carload of engines to supply his trade at that point. A 300-horsepower engine is being furnished the Union Distilling Co., of this city, to be installed in the new distillery now being rebuilt. Inquiries at this time are said to be exceptionally good. Trade on Puget Sound in the lumber business, and in Texas for the cotton ginning and oil mill trade, in Arkansas for irrigating plants, and from local concerns that are replacing worn out equipment, are the principal sources of trade at the present time.

MILWAUKEE.

Statement Respecting Vulcan Plant at Toledo—New Business Noted.

March 22.

More new building projects, extensive improvements and enlargements of business, due to the immense volume of orders are being noted almost daily. The excellent tone of business is growing better each week.

The Eclipse works of the Fairbanks-Morse Mfg. Co. at Beloit, Wis., will build an annex to the gas engine machine shop, 158 x 200 feet, one story, with sawtooth roof and solid concrete walls. Just north of the windmill plant a galvanizing shop building is to be erected, 50 x 140 feet,

of brick and concrete construction. Both buildings will give the company nearly 40,000 square feet of floor space over its present space.

The Freeland Steel Tank Co., of Portage, Wis., is now running at full capacity after a somewhat quiet winter. Orders for fifty tanks were shipped to Montana, Dakota and Nebraska last week. The volume of orders is expected to make it necessary to operate day and night.

With the advent of spring, Kearney & Trecker, the big manufacturers of milling machinery at West Allis, have resumed work on the big shop building, as reported in THE IRON TRADE REVIEW last fall.

E. K. Swigart, secretary and treasurer of The Bucyrus Co., South Milwaukee, who has just returned from Cleveland and Toledo, said respecting the reported absorption of the Vulcan Iron Co., of Toledo, by stockholders in the Bucyrus Co. and other concerns:

"The transaction is not a combination of the two plants, at South Milwaukee and Toledo, but is simply a case of men holding stock in both concerns. Mr. Horix has been manager of the Vulcan plant for some years and as the proprietor intended to retire, he took an option and interested Messrs. Eells and Steadman in the purchase. The plant, which is about 40 years old, is crowded into the river district of Toledo, with no chance to spread out. Evansville has offered 75 acres of land and bonus inducements amounting to about $200,000 and conditions are so favorable that the plant will no doubt be relocated there."

Herman Knitter has purchased a half interest in the Fred Hoehne Machine works at Kaukauna, Wis., and will assume an active part in the conduct of the business. Mr. Knitter was for many years city treasurer. Mr. Hoehne is owner of patents on a new type of friction clutch which is coming to be generally used in paper mills and other shops using heavy machinery.

BOSTON.

Labor Conditions Unsatisfactory—Contracts Awarded.

Boston, March 19.

The labor situation in this city and, indeed, throughout the New England section, is causing great anxiety to the trade, especially to the machine and tool men as it is among the latter that the labor agitators and organizers are most active at present. For several weeks the machinists and tool makers of Boston have been besought by every means at the command of the organizers to join the union in preparation for the demand on June 1 for a $4 daily minimum wage on a nine-hour basis. Mass meetings have been held in different parts of the city and on Wednesday of this week a new scheme was inaugurated. Urgent appeals for the men to join the union were painted on 10-foot signs, these being placed on wagons and hauled through the streets. This is regarded as the most startling plan put on foot in recent years and the originators boast that it will result in bringing the membership mark to 4,000 in the local union by the first of June. The manufacturers at present are lying low and waiting for the time when they shall have their say.

In addition to this, one of the most powerful labor lobbies ever seen on Beacon Hill is engaged in advocating labor legislation, notably the eight-hour bill, the picketing bill and the measure for the investigation of industrial disputes.

"It would be an eye-opener," says the bulletin of the Boston branch of the National Metal Trades Association, "for any manufacturer to attend one of these hearings at the state house and see the ceaseless efforts of labor to change the present laws."

Work was begun on Wednesday of this week on a temporary structure for the filling of rush orders by the Portland Specialty Mfg. Co., of Middletown, Conn., whose foundry was recently destroyed by fire. A permanent building will be erected later to replace the one burned.

Fire at the Chelmsford foundry last Saturday caused a loss estimated at $200. It is an open shop and one of the oldest in the state.

The Norcross Brothers Co., of Worcester, Mass., has been awarded a contract for $100,000 by the Brown & Sharpe Co., of Providence, R. I., manufacturer of high-grade tools and machinery, for an addition to its huge plant in Providence. The new structure will be 145 x 80 feet, and construction will be started at once. The contract calls for the completion of the work in five months.

An addition is under construction to the plant of the Walker & Pratt Mfg. Co., whose works and foundry are at Watertown, Mass., which will add one-third to its output of cooking ranges. This is the fourth extension within ten years.

LOUISVILLE.

Increase in Orders For Machinery—Avery Plow Additions.

305-6 Keller Building,
Louisville, Ky., March 21.

Machinery manufacturers in nearly all lines report, uniformly, a big increase in the number of orders which they have booked during the past few weeks, some announcing that the bookings for the year thus far already equal the total amount put under contract in 1909. Special machinery continues to dominate the situation. Makers of quarry machinery are unusually busy, this season of the year naturally being the one during which most of the work along this line is done, as quarry operations are now opening. The situation here is somewhat retarded, however, by the strike which is in progress in the Bedford, Ind., limestone district, and which is preventing quarrymen from adding to their equipment as they would have done under normal conditions. Distillery and brewery equipment of various kinds is also in good demand, according to reports of the manufacturers.

Business of the Louisville Drying Machine Co. has been very good thus far, contracts which have been secured being much larger than for the same period of last year.

Prospects are bright with the American Machine Co., which has landed several considerable orders during the past week. The plant has more work on hand than since the panic.

The National Foundry & Machine Co. is unusually busy in the machinery and steam pump departments, the demand in both these lines being heavy, especially for boiler feed pumps and distillery pumps. The foundry isn't very busy, however.

The New Albany, Ind., Mfg. Co., which makes a specialty of stone quarry and mill equipment, reports business better than for a long time. Though the Bedford situation is not favorable, many inquiries from other quarrying districts are being received. This company has just contracted for equipping its new power house. It has heretofore operated its plant partly by steam and partly by electricity, but it will be electrical power throughout hereafter. The company has found an increasing demand in the stone districts for electric cranes, which it is making in considerable number.

The Peerless Mfg. Co., manufacturer of grates, will build a new foundry building next month, moving the machinery from one of its present buildings to the new one in order to secure additional warehouse room. The new building will be 100 x 200. No new equipment will be needed. Though bus-

iness with the company is not heavy just now, the prospects are good.

The Louisville Car Wheel Co. reported that though there is very little buying being done by the railroads at present, the outlook is good.

The plant of the United States Cast Iron Pipe & Foundry Co. is running pretty nearly to its capacity. During the winter the melt was not nearly so great as now.

B. F. Avery & Sons, plow manufacturers, are rapidly completing their new plant in South Louisville, which occupies 45 acres and consists of 11 buildings. The foundry capacity of the new plant will be 40 tons a day, as compared with 20 tons now, and it will be able to turn out 2,000,000 plows a year instead of half as many. To give an idea of the extent of the new plant, the dimensions of some of the principal buildings are as follows: Foundry, 224 x 96; core room, 64 x 24; mill room, 48 x 96; machine shop, 48 x 96; blacksmith shop, 240 x 96; shear shop, 192 x 96. There will be considerable additions to the equipment, although most of the machinery now in use will be installed in the new plant. New drill presses and wood-working machinery will be required, and the company has just contracted for new tumbling mills in the foundry. The contract for a complete dust collecting system will be let shortly. The power will be supplied by three-phase 220-volt alternating current, replacing the present belt-driven system. The electrical equipment, including generator and motors, was secured from James Clark Jr., of Louisville, who is now manufacturing electrical machinery on a large scale. George M. Brill, of Chicago, designed the plant, and the Westlake Construction Co., of St. Louis, has the contract for the buildings. J. E. Ulrich, master mechanic, is supervising the installation of machinery. When completed, the plant will represent an investment of $1,000,000.

FOREIGN RAIL SALES.

Fair inquiries are before the railmakers, but bookings have been slow. The order for 22,000 tons of three sections for South Australia has been taken by the Workington Iron & Steel Co., and there are unconfirmed rumors that the 20,000 order for the Manchurian railways has been divided between the Hanyang Works, at Hankow, and American mills, and that the business has all gone to the United States. A couple of nice new inquiries have been put forward—12,000 tons of 60's for New South Wales and 9,000 tons of 75's for the India office.—The Ironmonger, London.

PORTLAND MINE

Is Being Stripped and Prepared For For Further Steam Shovel Work.

Republic, Mich., March 21.—The Rogers-Brown company has awarded a contract for the excavation of a second pit for steam shovel mining at its Portland property at the western end of the Marquette range, and in the neighborhood of 150,000 cubic yards of overburden will be removed this season. In addition to the stripping the company has arranged for the mining of 250,000 tons of ore. The contracts have been given to Hoose & Person of Iron Mountain, Mich. This firm had a similar contract at the Portland last year, when in addition to removing the overburden from a good-sized area it mined 80,000 tons of ore.

A new producer in the Amasa field of the Menominee range this season will be Pickands, Mather & Co.'s Red Rock or Channing property. A spur line was extended to the tract by the Milwaukee road last year. Since then the shaft has been deepened and an additional level is being opened. The Rogers-Brown company's Gibson mine, in the same locality, is employing a force of 125 men. The property has developed into a fine mine and is expected to show a material increase in output this season. The Michigan mine, a Steel Corporation property adjoining the Gibson still remains idle, as it has the past two years. It is slated to resume operations this spring, however, and will give employment to upwards of 100 men. South of the Michigan, Pickands, Mather & Co. are exploring a tract in Section 9, 43-33. This property was partially tested twenty years ago. Ore was found at that time, but its grade was such as was not in demand in those days and until now the property has been neglected.

Oglebay, Norton & Co.'s Ore Analyses.—Oglebay, Norton & Co. have just issued their annual catalog containing analyses of the iron ores they will be prepared to ship the coming season. The new list contains all the grades offered in 1909 except Glyuna and Hadley from the Yale mine and a number of new ores from the Menominee and Gogebic ranges not offered last year. The firm also includes ore from the Bray mine on the Mesabi range this year. Ore from this mine was shipped by Oglebay, Norton & Co. last year but the mine did not appear in their catalog of 1909. Their new Mesabi range property, the Woodbridge near Buhl, is not cataloged though development work has been in progress there for some time. In all the firm is offering 23 grades of ore an increase of six over the number offered in 1909.

FURTHER DETAILS AS TO NEW FORGE.

W. K. Anderson, general manager of the Anderson Forge & Machine Co., Detroit, has supplied further details as to the drop forge plant that the company is building on the new Detroit Terminal railroad. The hammer installation will include some of the largest steam drop hammers in use. These will be made by the Chambersburg Engineering Co., Chambersburg, Pa., and the power presses are to be supplied by the Toledo Machine & Tool Co., Toledo, O., which will build the presses according to special designs. The company will have a complete system of industrial tracks to handle raw material and carry finished product. In the die department, the heavier machines will be driven by individual motors, and the building will be supplied with five traveling cranes. In the forge shop will be two traveling cranes of sufficient capacity to handle any piece of machinery in case repairs are needed, and to place the larger dies, some of which will weigh at least five tons. The boilers will be water tube type and carry 200 pounds pressure. Oil will be used for fuel, and systems of concrete tunnels will be built to carry pipes for the oil, steam, and air. The air will be carried in spiral riveted pipe, and will be used for vaporizing oil. The heat treatment department will contain the latest designs in furnaces and oil baths, and will be supplied with a complete system of pyrometers. This is particularly necessary as the company is handling large quantities of special alloy steel for the automobile trade, which require very accurate temperature regulation.

ELECTRIC FURNACE IRON SUCCESSFUL.

The Northern California Engineering Works, Reading, Cal., advises us that it has been using the Heroult iron from the electric furnace for some time and finds it superior to any, as it is free from sulphur, is a good scrap carrier and makes fine, soft, strong castings, which machine beautifully. "Taken all around," says the writer, "we find it answers our purpose admirably."

THE COMBUSTION-TEMPERATURE OF CARBON AND ITS RELATION TO BLAST FURNACE OPERATION[1]

A Discussion of Some of the Conditions and Problems Encountered in Blast Furnace Practice.

By Clarence P. Linville.[2]

It is recognized that, in all metallurgical operations, the greatest possible uniformity in all conditions is essential to the best results. It is the constant aim of metallurgists to secure this uniformity, and their success in this respect has been in many cases the cause of great advances in the metallurgical processes themselves.

Of all such processes, the production of pig iron in the modern blast furnace is perhaps the most complex and the most difficult of control. Notwithstanding the great progress of recent years, there is still great difficulty in obtaining anything like uniform conditions and results in the manufacture of pig iron. The reason is not far to seek. The ores vary in composition and physical properties, often carrying a varying amount of gangue material, unevenly distributed. The coke may vary in composition, cell-structure, moisture, hardness, and other properties. The blast, the weight of which far exceeds that of any other constituent, varies in its moisture content and consequently in its chemical composition; and its temperature, by reason of the method of heating, is not uniform, but, besides varying from time to time with atmospheric and other outside conditions, has a maximum and minimum for every changing of stoves.

The Hearth Temperature.

Now, with regard to these variations, the modern demand for uniformity has been greatly aided. Chemical analysis has made it possible to select ores so that the composition of the charge can be kept fairly constant; coal may be obtained from a given field, and coked in the same kind of ovens under conditions which make the fuel practically uniform; the Gayley dry blast process has rendered the composition of the air almost constant, by reducing the amount of moisture to a constant quantity; and the temperature of the blast is often maintained almost constant, either by the use of "equalizers," or by the admixture of cold air with the hot blast.

An important point, however, which indeed has not been entirely overlooked, but which has not received the consideration it deserves, is the hearth temperature. It would seem to be a matter of the greatest importance to maintain the temperature of the blast furnace hearth at a uniform point, if possible. Many furnace troubles may be traced to a changing hearth-temperature, and if it were possible to maintain this constant, it is probable that these troubles would be greatly diminished.

The temperature of the hearth is determined by several factors, notably: the temperature of the burning coke; the amount of material to be fused; the melting points of the materials fused; the reactions other than carbon combustion; and irregularities, such as slips, which cool the hearth by precipitating cold material into it. Of these, the variables are the combustion temperatures and the irregularities due to slips. It is probable that if the variations of the first of these could be overcome, the effect of the latter would be greatly diminished. Combustion temperature, then, is the important consideration. The higher the combustion temperature, other things being equal, the higher will be the temperature of the hearth, and the more rapid will be the rate of fusion of iron and slag.

The lower portion of our iron blast furnace may well be considered as having several zones. In the lower part of the hearth is found the melted pig iron, covered with a thick layer of melted slag. Once the pig iron has reached the hearth, there is little chance for any further change in it. Its temperature may be increased through contact with the slightly hotter cinder, but this is partly counteracted by conduction to the ground and the walls of the hearth. The slag, being in direct contact with the combustion zone, has a much greater opportunity to become superheated, and is only deterred from reaching a temperature approximately the combustion temperature by the fresh material constantly melting and falling into it. The hottest part of the furnace is undoubtedly just in front of and above the tuyeres, where the coke is burned. The hot gases, as they rise, give up their heat rapidly to the descending materials.

At a greater or less distance above this place will be found the fusion zones, first for slag, and higher for pig iron. This distance will depend in each case upon the temperature of the combustion zone, the melting points of the materials, and the rapidity with which they pass downward through the furnace.

It can be readily seen that, given the

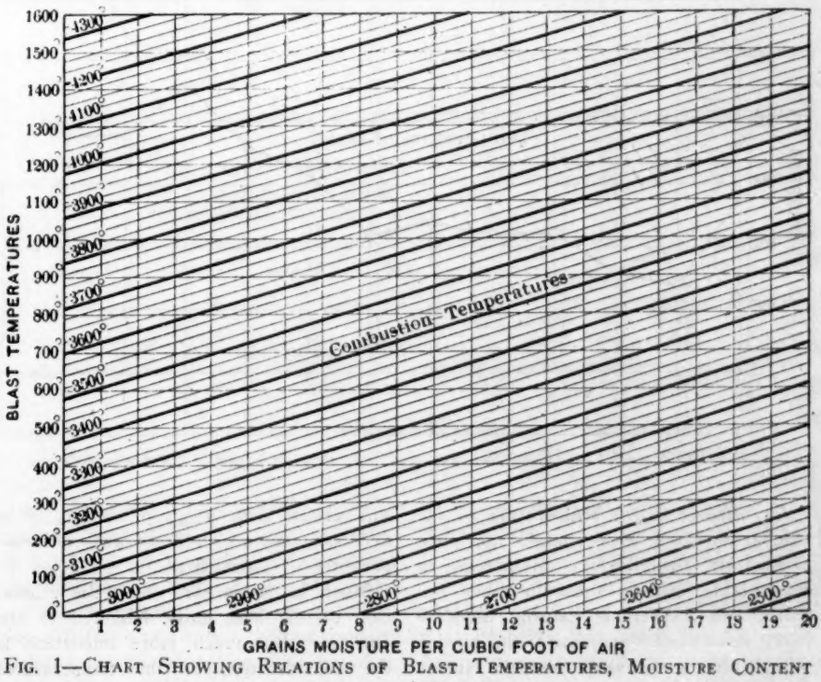


Fig. 1—Chart Showing Relations of Blast Temperatures, Moisture Content and Combustion Temperature.

[1]Pittsburg meeting, 1910, American Institute of Mining Engineers.

[2]Associate Professor of Metallurgy, School of Mines and Metallurgy, the Pennsylvania State College.

proper temperature, and the amount of slag and iron to be melted, an increase in the amount of coke can only result in delaying the operation of the furnace, since this coke has to be burned out before the material to be fused can descend.

It is probable that much of the trouble from hangs, slips, and scaffolds can be traced to these shiftings of the fusion zones. It would seem to be of the greatest advantage to be able to maintain the fusion zones as nearly stationary as possible, and in order to bring

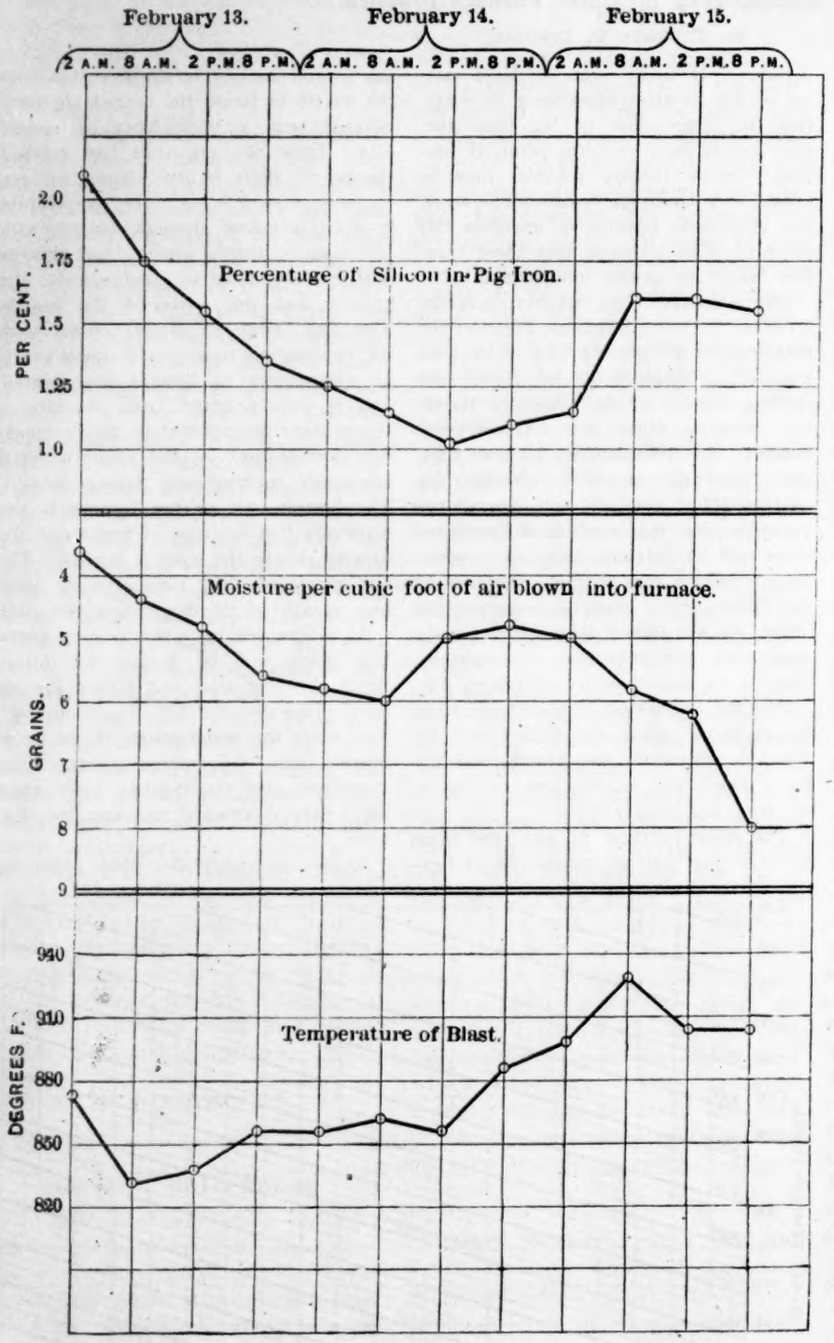


FIG. 2—CHART OF AVERAGE RESULTS OF BLAST FURNACE OPERATIONS.

Any change in the temperature of the combustion zone will change the position of the fusion zones, an increase in temperature causing them to move upward, and a decrease causing them to move downward. Increasing the burden would also somewhat lower the fusion zone.

this about, with a given burden, it is necessary to maintain a uniform temperature of combustion.

Much has been said about the utilization of the heat units delivered to the furnace. But much more important is the consideration of the temperatures produced by these heat units. Keep the temperatures right, and the heat units have a tendency to take care of themselves. It would matter little how much fuel were burned, or how many heat units furnished to the blast furnace, if the hearth temperature was not maintained at a point above the melting point of the slag produced. Keep the temperature above this point and the furnace will run. The higher the temperature the more rapidly it will run, provided there is not so much fuel present as to hinder the descent of fresh material.

Combustion temperature is, then, the important point, the amount of slag and iron melted in a given time depending almost wholly upon the surface exposed and the temperature of the gases passing around the melting particles.

The factors to be considered in determining combustion temperatures are the reactions of combustion and the temperature of the reacting substances. When these are uniform, the temperature of combustion will be uniform; but if, for any cause, there are variations in any factor, the temperature will be immediately affected.

Factors Controlling Combustion.

If we assume that in the blast furnace the conditions are maintained as nearly constant as possible, that the burden remains the same, the amounts of slag and pig iron are the same, and the reactions involved in their formation and fusion are consequently the same, then it will be the reactions of combustion of the solid carbon which affect the hearth temperature; and it may be expected that the temperature of the hearth will vary directly as the temperature of combustion of the solid carbon, being, of course, somewhat lower, but by an amount which is bound to be almost constant for a given set of conditions.

The factors which control the combustion temperature of solid carbon in the blast furnace are the composition of the air used and the temperature to which it has been preheated. The temperature obtained will be the result of the heating of the gaseous products of the combustion by the heat which is available, from the combustion of the carbon, from the sensible heat in the air, and from the sensible heat in the solid carbon at the moment of combustion. (Since the air contains more or less water vapor, this must be taken into consideration.) It may be assumed that the carbon particles have become heated to the temperature of combustion at the moment of the combustion itself.

In order to investigate the relations between temperature of combustion, blast temperature and moisture content of the air used, I have calculated the

combustion temperatures of solid carbon for the following four conditions.[3]

A, blast temperature, 0 degrees Cent., dry blast; *B*, blast temperature, 1,000 degrees Cent., dry blast; *C*, blast temperature, 0 degrees Cent., 20 grains moisture per cubic foot; *D*, blast temperature, 1,000 degrees Cent., 20 grains moisture per cubic foot. These values are found to be: *A*, 1,675 degrees Cent.; *B*, 2,510 degrees Cent.; *C*, 1,360 degrees Cent.; *D*, 2,260 degrees Cent. Since most American furnace men prefer to deal with the Fahrenheit scale, I have also calculated the following values:

	Degrees Fahr.
A—Blast temperature, 0 degrees Fahr., no moisture	3,018
B—Blast temperature, 1,600 degrees Fahr., no moisture	4,353
C—Blast temperature, 0 degrees Fahr., 20 grains moisture	2,453
D—Blast temperature, 1,600 degrees Fahr., 20 grains moisture	3,885

Using the values given in Fahrenheit degrees, I constructed a chart (Fig. 1), showing the relations for all moisture contents up to 20 grains per cubic foot, and for all temperatures up to 1,000 degrees Fahr.

This chart is not strictly correct, since it assumes that all temperatures of combustion will be proportional to the differences from the figures given. As a matter of fact, there is a slight variation, but not enough to make any essential difference in the results. The combustion temperature lines should show a slight upward curve.

The Effect of Moisture.

This chart shows that changes in combustion temperature may be due to either or both of two things. If the blast temperature be maintained constant, the combustion temperature will vary with the amount of moisture. Roughly speaking, it may be said that each grain of moisture per cubic foot of air will lower the combustion temperature about 25 degrees Fahr. If the amount of moisture remains constant, increase of the blast temperature will raise the combustion temperature, the amount being, roughly, 85 degrees Fahr. or every 100 degrees Fahr. increase in the blast temperature. It may also be seen that the decrease in combustion temperature due to 1 grain of moisture may be compensated by carrying a blast temperature about 30 degrees higher.

Most furnace managers make some attempt to regulate the hearth temperature by controlling the blast temperature, but they do this only by observing the operation of the furnace, and making the correction by raising the blast temperature after it has become evident that the hearth is cooling. If the blast temperature could be so maintained that the cooling did not take place at all, the practice would be much better.

The problem is solved in the Gayley dry blast plants by maintaining a uniform moisture content, thus making it a simple matter to maintain, by means of a very nearly uniform blast temperature, a nearly uniform combustion temperature, thus securing a practically uniform operation of the furnace.

For the plants that have not as yet installed dessicating plants for the air, it is probable that much benefit would follow a more careful attempt to control the temperature of the hearth

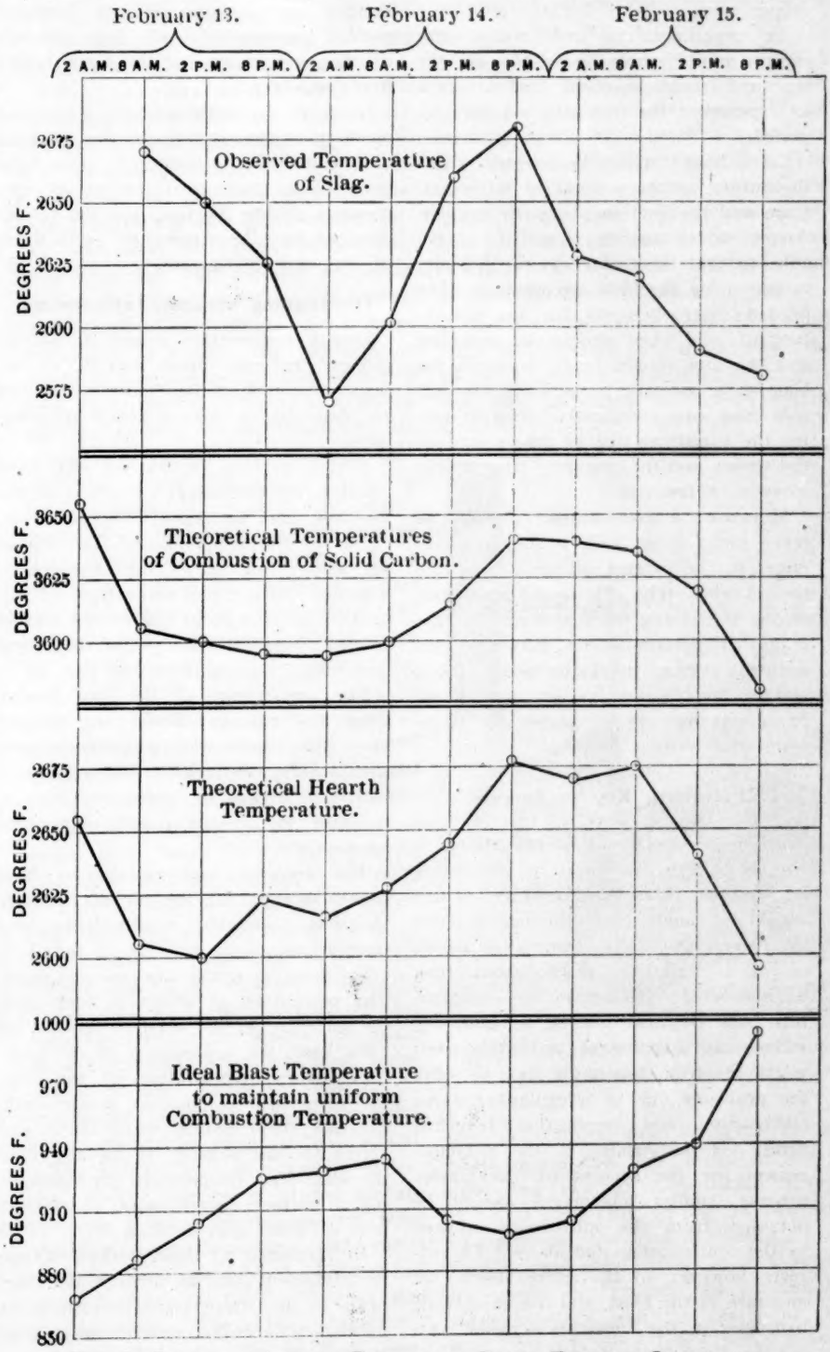


FIG. 3—CHART OF AVERAGE RESULTS OF BLAST FURNACE OPERATIONS.

[3] I do not claim special originality for these calculations. They were based on the work of Prof. Joseph W. Richards, as given in his articles on Metallurgical Calculations, and afterwards in his book on that subject. I have used also the graphic method described by Damour and Queneau, in their book on "Industrial Furnaces." To Mallard and Le Chatelier I am likewise indebted. Specific heats and heats of reaction were taken from Prof. Richards' articles in Vol. I, of his book. Since I employed his constants, it is not surprising that my results should closely coincide with his. But I was not aware that he had made calculations of the combustion temperature of carbon under various conditions until I saw them in his second volume after my own were finished.

That part of this paper for which I may claim originality is the diagram showing the relations between the moisture content of the air, the blast temperature, and the resulting theoretical temperature of combustion; and the application of this diagram to the problem of the control of combustion temperatures, and thus, incidentally, to the attainment of uniformity in blast furnace operations.

through hot blast manipulation. This has been suggested before, but has generally been put aside as not valuable enough to compensate for the trouble involved. Yet it would seem to be a simple and not very difficult matter if undertaken by careful men and in the proper spirit.

An experiment in such temperature control would surely be well worth the time and trouble involved; and for such an experiment the following plan is suggested:

Let a blast furnace be selected where the burden can be maintained fairly uniform and the fuel supply fairly regular. Ample stove capacity should be available, so that there shall be no difficulty in increasing the blast temperature when needed. Arrangements for the admixture of cold blast should be provided, and the aim should be to maintain the blast at a constant temperature through cold blast admixture rather than to suffer the variations due to the cooling of the stoves, and the changing from a cold stove to a hot one.

Moisture determinations should be taken every hour with a sling-psychrometer in the current of air drawn into the blowing tubs. If more than one engine is running on a furnace, the average of determinations taken at the different engines should be taken; and a certain combustion temperature should be agreed upon as the proper one to be maintained during the test.

Uniformity Key to Success.

From the moisture determinations, it will be a simple matter to determine the proper blast temperature which should be maintained. This can be done by reference to such a chart as is shown in Fig. 1. The stove tender should then be instructed to maintain this temperature until the next reading is taken.

Such an experiment is surely well worth the trial, and might help to solve the problems due to irregularity of air composition and combustion temperatures. If uniformity is the principal reason for the success of the Gayley process, similar advantages should be obtained from the uniformity secured by the control suggested above. The effects, however, of the entire absence of moisture in the blast, and the absence of hydrogen in the combustion gases, cannot be thus controlled.

In order to illustrate the close relations between combustion temperature and furnace operation, the following results, obtained from a recent blast furnace test, are given:

The test was made in February, 1909, on a 300-ton furnace, covering the operation of the furnace for 72 hours; and was primarily designed to determine the heat distribution.

The necessary data were obtained by hourly determinations of the moisture of the blast; hourly analyses of downcomer gases; continuous record of blast temperature taken by a recording pyrometer; record of weight and analyses of samples of each cast of pig iron; samples and analyses of each flush of cinder, accompanied with determination of the temperature by the Fery radiation pyrometer.

In order to investigate the effects of combustion temperature on the working of the furnace, calculations have been made of the theoretical combustion temperature during the test, and the results obtained have been compared with those of the furnace operation.

Determining Hearth Temperature.

Hearth temperature cannot as yet be judged, by any direct means, so we have to rely on certain indirect methods for determining relative hearth temperatures.

With a uniform burden and slag composition, the percentage of silicon in the pig iron may be taken as a fair indication of the temperature. The higher the silicon, the higher the hearth temperature; hence the percentage of silicon in the iron from cast to cast should follow somewhat closely the theoretical combustion temperature.

The temperature of the slag flowing from the furnace should also depend upon the combustion temperature, and should vary, other things being uniform, with it. It will be interesting then to compare the results found with these assumptions.

The readings and calculations have been averaged for the periods between the casts, and the results have been plotted, as shown in Figs. 2 and 3.

In these diagrams the curves show: The percentage of silicon in each cast; the moisture in the blast, in grains per cubic foot; the temperature of the blast; the observed temperature of the slag; the theoretical combustion temperature; the theoretical hearth temperature, corrected for the basicity of the slag; and the ideal blast temperature for maintaining a uniform temperature of combustion of 3,650 degrees Fahr.

In reference to these curves, it may be explained that an attempt has been made to plot them on a uniform scale, so that the results will be easily comparable.

A slight change in burden was made at the end of the first 24 hours, lowering the amount of iron, but increasing the amount of slag.

The slag temperatures were taken as carefully as possible; but in some cases it was difficult to secure accurate readings, fumes arising in clouds from the surface of the slag so as to obstruct some of the heat rays. It is thought, however, that the averages shown are very close to the proper values.

The line representing theoretical hearth temperature is drawn empirically only. It assumes that the hearth temperature is about that of the slag, or about 1,000 degrees lower than the combustion temperature of the solid carbon.

Allowance was also made for the differences in fusion temperatures of the slags, it being found that a difference of about 70 degrees Fahr. existed between the more basic and the less basic. The mean of these was taken as a base line for corrections, and the degrees of the fusing temperature above or below this mean were added to or subtracted from the combustion temperature after subtracting 1,000 degrees.

It will be noted that at the beginning of the test the percentage of silicon in the pig is fairly high; that it rapidly decreases for about a day and a half, when it rises to a maximum at the end of two days and a half, then falling somewhat at the end of the test.

A remarkable similarity will be observed among all of the curves in that their general shape is the same, and their maxima and minima correspond very well with each other and with the silicon curve.

The curve for observed slag temperature follows almost exactly the corrected hearth temperature curve, as indeed it should do.

Conclusions.

The effect of moisture on the slag temperature is well illustrated; its effect on hearth temperature evidently being somewhat greater than the calculations show. The amount of moisture varied greatly during the test, running from 3.7 grains per cubic foot at the beginning to a little more than 8 grains at the end. The bad effects of this excessive moisture were, however, largely counteracted by the gradually increasing blast temperature.

The conclusions to be drawn from the test, so far as hearth temperatures are concerned, seem to be about as follows:

The effects of lowering the theoretical temperature of combustion are to give a cooler slag and an iron lower in silicon.

The lowering of the silicon follows very closely the fall of the theoretical temperature of combustion, but the raising seems to lag somewhat behind the increase of the combustion temperature.

The effects of moisture in the blast may be compensated by increasing the blast temperature, so far as it concerns hearth temperature, the temperature of the slag, and the composition of the pig iron.

The temperature of the slag follows very closely the calculated combustion

temperature, being, of course, much lower.

In connection with the regulation of the hearth temperature, the last curve is given as an illustration of what the blast temperature should have been, so as to give a uniform combustion temperature of 3,650 degrees Fahr., this being about the temperature at the beginning of the test. The temperatures used for this curve are as follows:

	Moisture, Grains.	Blast Temperature, Degrees Fahr.
1	3.7	868
2	4.4	886
3	4.9	904
4	5.7	925
5	5.8	928
6	6.0	935
7	5.0	908
8	4.8	900
9	5.0	908
10	5.8	928
11	6.2	940
12	8.0	992

If we should assume that the amount of moisture had been held uniform at 2 grains per cubic foot, the same result could have been obtained by maintaining a blast temperature of 820 degrees Fahr.

A NEW TYPE OF METER FOR MEASURING THE FLOW OF STEAM AND OTHER FLUIDS.

By A. R. Dodge.

The ever increasing demand for more economical generation and consumption of steam makes it imperative that the up-to-date engineer shall avail himself of every possible means for determining the behavior of apparatus that is employed for these purposes.

For many years the electrical engineer has had instruments at his command by the use of which he could determine exactly the performance of the various electrical machines. On the other hand, despite the fact that the utilization of steam and the science of steam engineering antedates the practical, commercial application of electricity by half a century or more, the steam engineer has been provided with no such instruments, and has had to content himself with the simple knowledge that he was generating enough steam to do a certain amount of work; just how much steam it was that he was actually generating he could not tell. It must be conceded that it is as important to measure the steam delivered to the prime mover as it is to determine the output of the electric generator. This point is fundamentally important, but up to the present time there seems to have been no large amount of work spent on the development of instruments which possess the desired properties of beeing easy to install and of accurately measuring the rate of flow of steam.

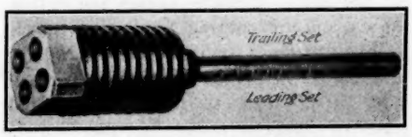


Fig. 1—Nozzle Plug.

The former efforts in this direction are covered by two general types.

About 10 years ago a device for measuring steam flow was brought out in which a diaphragm containing an orifice was inserted between flanges in the steam pipe, and the difference of pressure between the two sides of the orifice was measured, from which pressure difference the amount of steam passing through the orifice was known from previous calibration. No attempt was made to correct for moisture or superheat, and there is a loss of steam pressure through the orifice at ordinary loads of about 3 pounds, which loss increases in pressure at overloads, limiting the output and efficiency of the steam distribution system. To install this device necessitates shutting off the steam for several hours; removing a section of piping and inserting a new section, together with new gaskets and diaphragm in the same available space as was occupied by the removed section.

The second type is known as the float type meter and consists of a vertical spindle which carries a disk, actuated by the steam, an arrangement somewhat similar to the safety valve of a steam boiler with the spring removed. The more the flow of steam, the more the spindle will lift due to the pressure difference on the top and bottom. The spindle is connected through the stuffing box to an external pointer, by means of which the opening of the valve, and hence the amount of steam passing through, is known from previous calibration. Either the disk or the surrounding chamber may be cylindrical, provided the other part is conical.

The stuffing box is a serious objection, as the friction is always an appreciable amount of the moving force available from the steam, and varies over a wide range. A leakage of steam through the stuffing box is also apt to occur. These two characteristics tend to make the readings inaccurate. Such meters owing to their relatively large size and cost are not practical for pipes above 6 inches in diameter.

In the meter to be described, these objections have been eliminated and an instrument developed which, without the use of weighing tanks, scales, or other special apparatus, will determine the amount of steam, air or other fluid flowing in a system of piping.

If the temperature and pressure of the gas is a constant, the amount of steam used in a machine or group of machines is, of course, proportionate to its velocity in feet per second. This velocity, therefore, constitutes a means of measuring this quantity if the velocity, itself, can be measured. It is a well known fact that velocity is converted into pressure by means of an inverted nozzle with practically no loss and always under the same law. The measure of this pressure, due to velocity, is the most reliable means we have of determining the velocity of steam in nozzles, which may be as high as 2,500 feet per second.

The velocity being thus determined from the pressure, the quantity of the steam is at once deducible, being proportional as stated above. A nozzle plug is screwed into the pipe at the point where the flow is to be measured and extends diametrically across it. This plug (Fig. 1) carries two sets of openings; the first or "leading" set faces against the direction of flow, while the second or "trailing" set consists of three openings near the center of the plug, one of these latter being shown in the figure. The steam impinging against the leading set of openings, sets up a pressure in them which is equal to the static pressure plus a pressure due to the velocity head; while the pressure in the trailing set is equal to the static pressure minus a pressure due to the velocity head. On account of the small diameter of this nozzle plug,

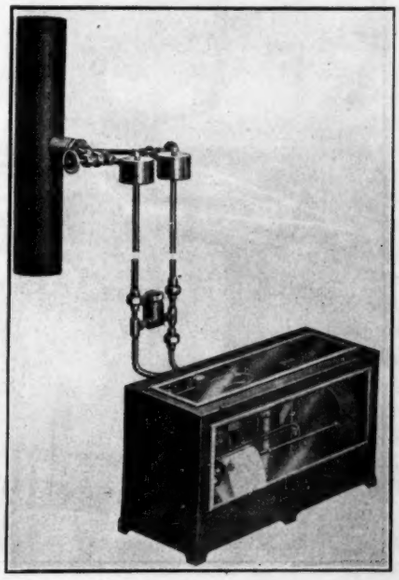


Fig. 2—Recording Steam Meter, Showing Connections to Pipe.

no appreciable drop in steam pressure is caused by its insertion in the main, even if the velocity be very high.

Since the nozzle plug extends diametrically across the main, the difference of pressure set up in the two sets of openings will be proportional to the mean velocity of the gas. This pressure difference is transmitted through separate longitudinal chambers to the outer end of the plug and from there, by proper piping, to the meter, which consists essentially of a U tube of glass or metal partially filled with mercury (or other fluid of greater specific gravity than the fluid to be measured). The difference in pressure in the leading and trailing sets of openings is communicated to the two sides of the U tube and causes a difference in level in the two legs of the fluid column.

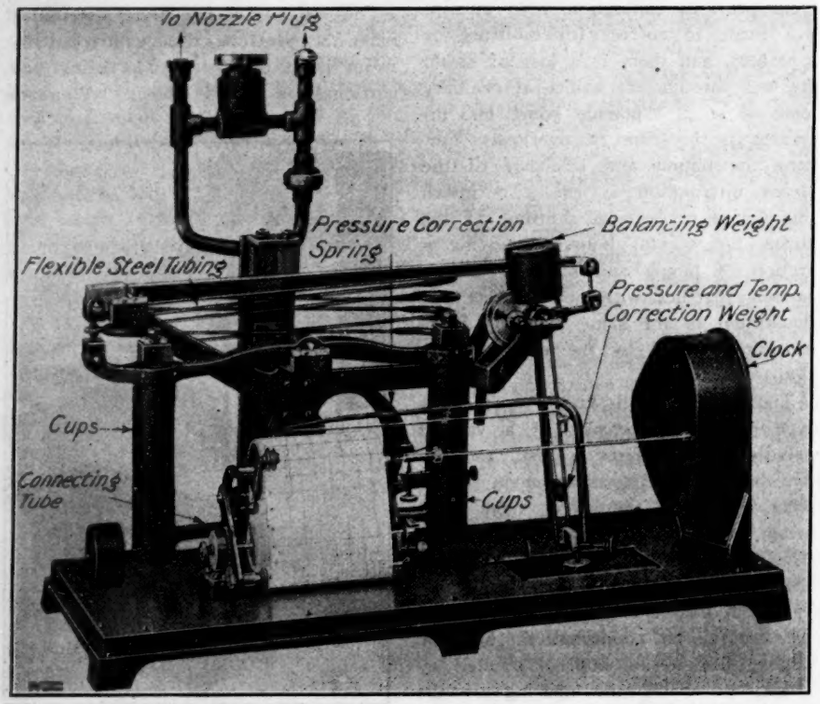


FIG. 3—RECORDING STEAM METER.

Meters suitable for measuring the rate of flow of steam are calibrated to read directly in pounds per hour, while those for measuring the rate of flow of air are calibrated in cubic feet of free air at a temperature of 70 degrees Fahr.

If it is desired to operate the meter on steady flow, such as occurs in supplying steam to steady flow turbines, heating systems, manufacturing processes, etc., no recalibration is necessary after installing, as all meters are calibrated at the factory for this condition.

If, however, the meter is to be used on periodically intermittent flow, such as occurs in supplying steam to intermittent flow turbines, reciprocating engines, pumps, etc., it must be recalibrated after it is installed, unless the arrangement of the piping permits the insertion of the nozzle plug at a point where the flow is steady. For example: Where an engine is supplied with steam by a long pipe line, the nozzle plug may be inserted near the boiler where the flow is steady.

No change whatever is required in the main piping system of the station to install the meter; it is only necessary to drill a small hole in the main for the nozzle plug.

Recording Flow Meters.

The recording flow meter for measuring the rate of flow of steam is a curve drawing instrument, giving an accurate record of the rate of flow in pounds per hour, in pipes of any diameter, at any degree of temperature, pressure, or moisture.

The meter consists of two cylindrical hollow cups filled to about half their height with mercury, and joined together at the bottom by a tube. This arrangement of cups and connecting pipe forms the U tube, which is supported upon a set of knife edges about which it is free to move as a balance.

Any difference of pressure in the two sets of openings in the nozzle plug is communicated to the cups through flexible steel tubing placed inside the case, and causes the mercury to rise in the left hand cup and fall in the right hand cup until the unbalanced columns of mercury exactly balance the difference in pressure.

By the displacement of the mercury, the beam carrying the cups moves downward on the left hand side of the knife edges. This side will descend until the moment of the weights on the right of the knife edges exactly balances the moment caused by the displacement of the mercury into the left hand cup. The motion of the balancing beam is multiplied by suitable levers and actuates the recording pen which moves in proportion to the amount of mercury displaced.

The time element of the meter consists of an eight-day clock, which drives the drum feeding the paper. A paper feed of 1 inch an hour has been adopted as standard and one roll of paper is sufficient for about a month's record. All recording meters are equipped with a re-roll device, which is operated by spring mechanism, and is of sufficient capacity to accommodate one complete roll of paper.

Compensating Devices for Pressure and Superheat Variation.

The velocity of the steam being measured may remain practically constant, while the pressure and temperature vary over a considerable range; to obtain the actual rate of flow in pounds per hour, it is necessary to compensate for the latter fluctuations.

This compensation is made automatically in the case of pressure variations, by a hollow spring, similar to the pressure spring in a steam gage, which is connected so as to be influenced by the static pressure at the point where the flow is being measured. Any variation of the static pressure causes the spring to expand or contract, and this movement actuates a small correction weight in such a manner as to affect the deflection of the pen, so that the indicated rate of flow recorded by the pen is correct.

Compensation for temperature variation is made by an independent hand adjustment of the same correction weight that corrects the reading for pressure variations. This adjustment is made by increasing or decreasing the distance of the correction weight from its point of suspension; this distance is determined from a curve furnished with the meter.

Indicating Flow Meters and Meters For Constant Temperature and Pressure.

In many stations steam is generated at practically constant pressure and temperature; this will be found to be especially true where a battery of boilers is supplying steam to one unit. For such conditions the automatic pressure correction is not essential, and the meter

is adjusted by hand to suit the existing conditions of pressure and temperature.

This type of flow meter will meet general commercial requirements where an indicating instrument is desired. It will be found especially useful for testing work, locating troubles due to leaks, etc. This indicating meter gives an accurate reading of instantaneous rate of flow of steam or air or any other gas, at any condition of temperature, pressure, or moisture. If used to measure steam flow, it gives a true indication of the instantaneous rate of flow in pounds per hour per square inch of pipe cross sectional area.

As it is portable, a single meter may be utilized to obtain readings in any number of different pipe lines through a station. It is only necessary that each pipe be provided with the proper nozzle plug to which the meter can be connected.

The meter consists of an iron casting which is cored out to form a U tube, which, as with the other types of meters, is filled for part of its height with mercury or water, and, as in their case, a difference of pressure in the nozzle plug causes a difference of level in the two columns of the liquid. A small

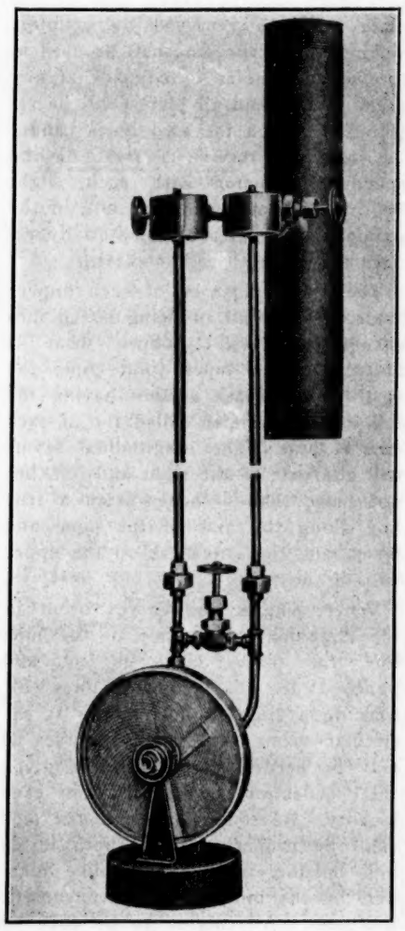


FIG. 4—INDICATING STEAM METER AND PIPE CONNECTIONS.

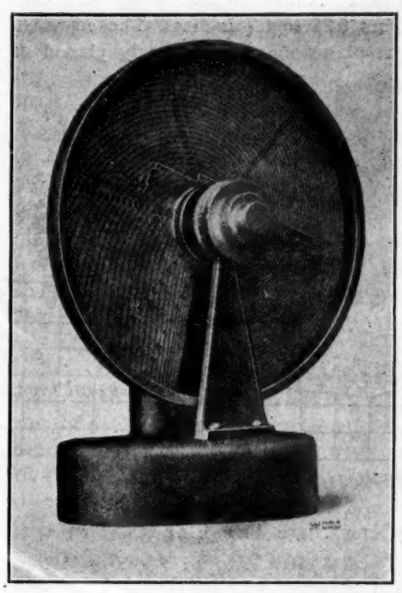


FIG. 5—INDICATING STEAM METER.

float suspended by a silk cord actuates a pulley over which the cord passes; the pulley, in turn, moving a small bar magnet on the end of shaft next to the dial in proportion to the change in level of working fluid in the U tube.

The indicating needle is mounted in a separate cylindrical casing. Another bar magnet is mounted on the inner end of the needle shaft, and is free to turn in the same plane as the magnet on the inside of the meter.

The mutual attraction of these two magnets keeps them always parallel, and by this arrangement the necessity of a packed joint for transmitting the motion of the pulley to the indicating needle is eliminated.

The pipe, receiver and nozzle plugs are of the same general design as those used with the recording meter.

The proper adjustments for pipe diameter, temperature and pressure are readily made by setting the graduated cylinders which actuate the rack carrying the pointer. When these settings are made, the rack is rotated by hand until the pointer coincides with the indicating needle. The point on the graduated scale at the intersection of the needle and pointer gives the true instantaneous rate of flow per square inch of pipe cross sectional area.

Meters of both types have been in service in the Schenectady Works of the General Electric Co. for several years, and their employment provides data for continuous records of steam and air used in the principal buildings, thereby indicating where avoidable losses may be eliminated.

A number have been installed in this country and Europe, and have been giving satisfactory service under various conditions.—*General Electric Review.*

STRUCTURAL FEATURES OF A 24-MILE STEEL PIPE LINE FOR THE PORTLAND, ORE., WATERWORKS.

The accompanying drawings illustrate the main structural features of one of the longest steel pipe lines for water supply that has been planned in recent years. The line will be 24 miles long; 10 miles 52 inches in diameter and 14 miles 44 inches in diameter. It extends from headworks on Bull Run river to the Mt. Tabor reservoir of the Portland, Ore., waterworks. Figure 1 shows a profile of the line, redrawn from the bidding plans and the following data are taken from these plans and form the specifications. Because of the importance of the work we believe that these data are worth study. The engineer of the work is D. D. Clarke, chief engineer, water board, Portland, Ore.

Material Specifications.

The steel plates used in the manufacture of the pipe shall be made by the open-hearth process, and shall be of the grade known as "soft." The ultimate tensile strength of the steel shall be between 52,000 and 62,000 pounds per square inch. The elastic limit shall not be less than 31,000 pounds per square inch. The elongation shall not be less than 25 per cent in 8 inches, when measured longitudinally, and 22 per cent when measured transversely, and there shall be a reduction of area at the point of fracture of not less than 50 per cent. The steel must not contain more than 0.05 per cent sulphur, 0.04 per cent phosphorous, 0.10 per cent silicon and 0.5 per cent manganese.

The chemical requirements for rivet steel shall be the same as those specified for the steel plates. The steel shall be "soft" and shall have a tensile strength of between 48,000 and 58,000 pounds per square inch; test bars shall be round, 8 inches long between measuring points, and of a diameter equal to the full diameter of the rivets. The elastic limit shall not be less than 29,000 pounds per square inch, and with an elongation of not less than 26 per cent and with a reduction of cross-section area at the point of fracture of not less than 50 per cent.

All plates and rivets must be kept free from rust and be kept under cover from the time of their manufacture until the pipe is dipped and coated. At the place of manufacture the plates must be loaded under cover upon suitable covered cars satisfactory to the engineer or his authorized

representative. They must at no time be exposed to the weather or to moisture, and must be delivered under cover at the pipe shop. In case of accidental rust, either during transportation or the process of manufacture, the rust must be removed from the plates at once by brushing with stiff brushes and scrubbing them with diluted acid, followed by mopping or brushing with a saturated solution of soda or other suitable alkali to remove the acid; this to be continued until all the rust has been removed. The alkali must then be washed off and the plates thoroughly dried.

The steel pipe shall be in part 52 inches and in part 44 inches in the internal diameter of the inside courses. The thickness of the sheets will vary from 0.25 to 0.7 inches. The edges of the plates must be properly planed or cut to true lines and beveled for calking all around and at the end of each course where the lap of the longitudinal seam occurs, the plate must be reduced by cold hammering or planing, or both, to a fine edge, through which one of the rivets of the round seams must be driven to insure tightness. In addition to this rivet, still another rivet must be driven through the three thicknesses of the plate at such joints.

All longitudinal or straight seams are to be double riveted, and the round or circular seams single riveted. The length of the rivet shank shall be such that the height of the finished head shall not be less than 0.6 of the diameter of the rivet hole. Shop riveting must be done with hot rivets by steam, compressed air or hydraulic machinery, capable of exerting a slow pressure sufficient for the formation of perfect rivet heads. The rivet holes must be punched from side of the plate which is to be placed in contact with another, and all burrs caused by the punch on the lower side of the plate must be removed by countersinking. No drift pin shall be used in forcing rivet holes to coincide at any seam or lap, and all plates will be rejected in which the said holes cannot be made to receive a rivet of the specified diameter with such slight drifting or reaming as will not, in the opinion of the engineer, materially reduce the strength of the plate.

The plates must be of such dimensions as to admit of being rolled into shapes that will produce what is known as the taper joint pipe, the small end of each section having the full inside diameter called for in each size of pipe. The longitudinal seams will alternate to the right and left, but not more than 6 inches from a true line along the axis of the pipe, and when laid, they must be on the upper half of the pipe.

Where angles and curves occur in the alignment and grade of the pipe line, the plates must be cut and punched to the required lines for forming a slight oblique angle at the circular seams, of as many courses as may be needed to produce the given total deflection, or curvature in each locality. As soon as riveted, the pipe shall be properly calked, both inside and outside, in a workmanlike manner, by the most approved pneumatic machines. All calking to be done by round-nosed calking tools, no split calking being allowed.

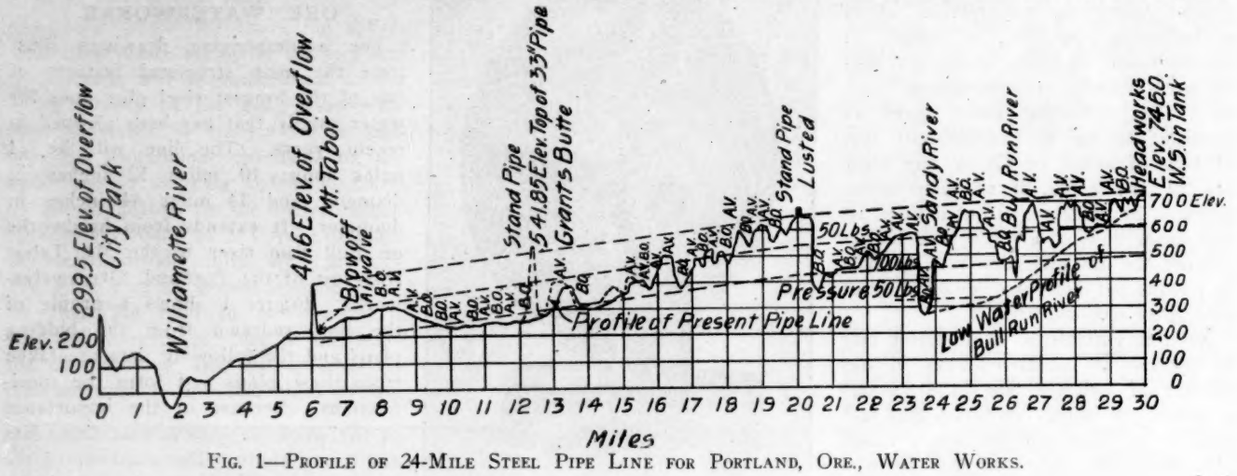


FIG. 1—PROFILE OF 24-MILE STEEL PIPE LINE FOR PORTLAND, ORE., WATER WORKS.

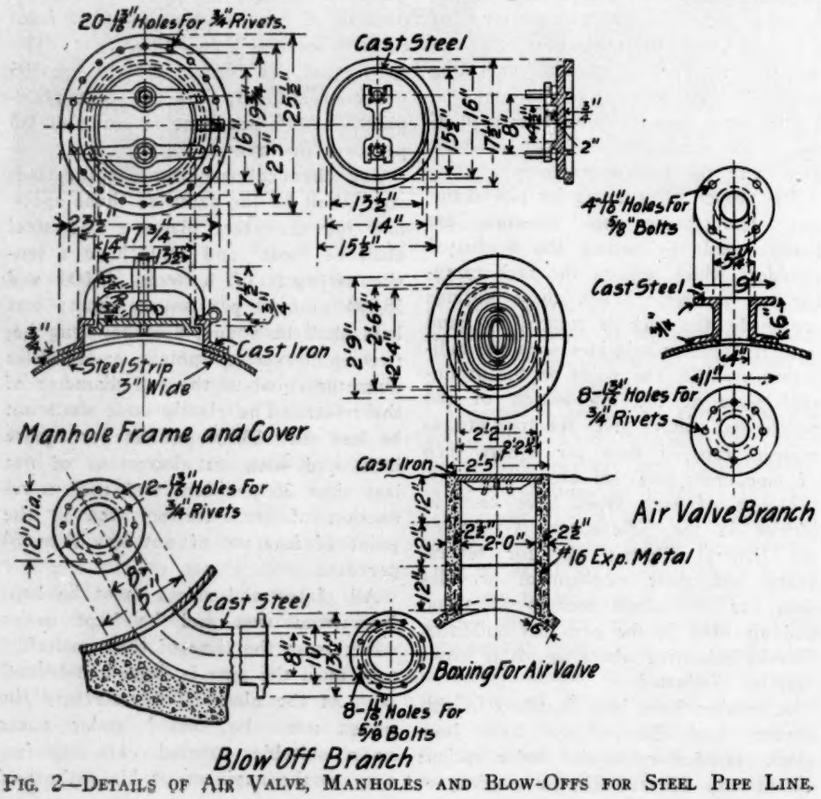


FIG. 2—DETAILS OF AIR VALVE, MANHOLES AND BLOW-OFFS FOR STEEL PIPE LINE.

Each section of the pipe after completion and before being coated, shall be subjected to a hydrostatic pressure of at least 1½ times its normal working pressure as shown on profile of pipe line, and must, during said test, be absolutely free from leaks or fracture. Unless otherwise directed by the engineer, all pipe for use under 50 pounds pressure or less shall be tested to 75 pounds per square inch; all pipe for 50 to 100 pounds pressure shall be tested to 150 pounds per square inch; all pipe for 100 pounds pressure and above shall be tested to 225 pounds per square inch.

Before the pipe sections are coated, they shall be thoroughly cleaned by the sand blast, or other equally efficient means, so as to show in all parts the grayish-white color of the metal. After the above described cleaning and inspection, which must be done under cover, every pipe shall be coated with "Mineral Rubber Coating," or such other material equal thereto in all its qualities, as hereinafter specified. The coating must be

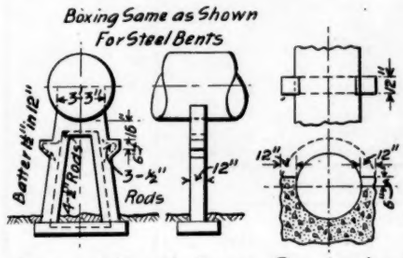


FIG. 3—DETAILS OF CONCRETE TRESTLE BENT FOR STEEL PIPE LINE.

free from blisters and bubbles, and must not be affected by exposure nor by the action of the soil or salt water. It must strongly adhere to the pipe under all circumstances, and must not become soft enough to flow at a temperature of 150 degrees Fahr., nor brittle enough to crack or scale off at freezing temperature.

The pipes before being dipped must be clean and free from rust, and no pipe shall be coated unless examined and approved by the inspector immediately before the process of coating begins. They shall be dipped in a bath of the "Mineral Rubber Coating," heated to 400 degrees Fahr., or more, and shall receive a uniform coating not less than 1/16 inch in thickness. While in the bath the pipe shall be so manipulated, scraped, brushed and redipped, if necessary, in accordance with the directions of the inspector, as to give a sound and perfect coating. After the pipes have been removed from the dipping tank they shall be set vertically while cooling. Proper facilities for handling the pipes and allowing all surplus material to drip off shall be provided by the contractor. The cost of all labor and material involved in the coating of the pipes must be included in the price bid for furnishing and laying said pipes.

At intervals of approximately 500 feet, the contractor shall place on the steel pipe, man-holes with covers, gaskets and bolts complete as shown by Fig. 2. The openings for said manholes shall be elliptical, with clear major and minor diameter of 16 inches and 14 inches, respectively; the joints between the frame and cover must in all cases be made watertight by facing the abutting surfaces and inserting a suitable gasket of sheet copper or lead. Estimated number required, 206. The manholes shall be connected with the pipe by means of steel rings 3 inches wide, and not less than ⅜ inch thick, placed on the inside of the larger courses and riveted to the steel pipe and flanges of the fittings by hot rivets of suitable size. After the riveting is done, the edges of the sheet shall be chipped and calked on the inside, so that the joints may be perfectly watertight.

Air valves 4 inches diameter are to be placed on the pipe at points indicated on the profile. The valves are to be of the pattern known as the "Crispin Automatic Air and Vacuum Valve," or some other approved model, with ½ inch bibb. Cast steel branches having flanges to conform to the circumference of the pipe at one end, and the other end to fit the flanges of the valve, shall be used for attaching them to the pipe. Between the check valve and the casting on the pipe there shall be placed a 4 inch double flanged gate valve. Each air valve is to be protected by a concrete well and iron cover, as shown on the plan. Where the pipe is located within 30 feet of the hydraulic grade 3 inch galvanized iron stand pipes with a 3 inch service cock near the pipe may be substituted for the air valve, if directed by the engineer. These stand pipes to be boxed in with a box filled with sawdust.

Blow offs 8 inches in diameter are to be placed at the bottom of the pipe in depressions as shown on the profiles. Each blow-off shall be furnished with sufficient 8 inch extra heavy Kalamein pipe, properly laid to point of discharge. Each blow-off, manhole, air valve, gate valve, and other fixture on the pipe, unless otherwise specified, is to be provided with a box of sound cedar plank of suitable dimensions.

In laying the pipe in the trench the pipe sections shall be so handled as to cause the least possible injury to the coating, and if any damage is done, it shall be repaired immediately with Mineral Rubber Field Paint. Before

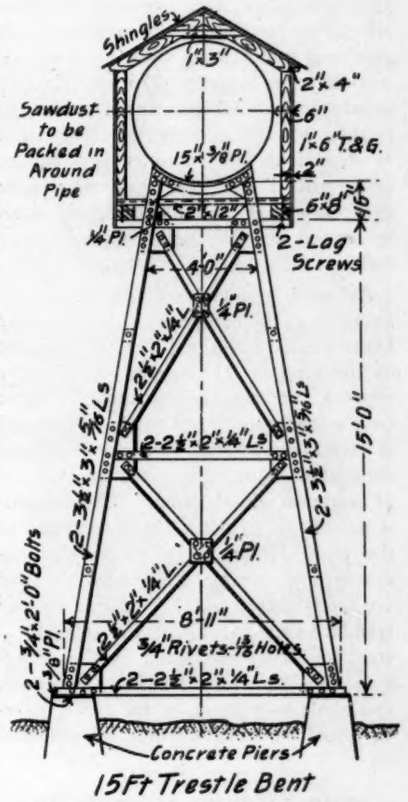


FIG. 4—STEEL TRESTLE BENT FOR STEEL PIPE LINE.

laying, the ends of each length, for a distance of 3 inches, must be carefully scraped inside and outside, and the coating entirely removed, to insure a perfect contact of the steel. Two lengths of pipe must then be riveted together and lowered into the trench, or placed on the grade prepared to receive the same. When lowered into the trench the bottom of the trench shall be to grade shown on profile, and must be free from water.

Field riveting for connecting lengths of pipe, specials, etc., shall be done as far as practicable, in the manner specified for shop riveting. The smaller end of the double length will be forced into the larger course of the pipe already laid, and properly riveted together, the two plates being set up tightly against each other with a set tool. As soon as each joint is riveted and calked it must be thoroughly cleaned and painted with Mineral Rubber Field Paint.

After the pipe has been laid in the

trench it must be plugged at the ends and tested with hydrostatic pressure in convenient sections, of such lengths as the engineer may direct, to at least 1½ times the pressure to which it shall be subjected under the natural working pressure when in operation. Calking must be continued until the pipe is tight at this pressure. Unless otherwise directed by the engineer, all pipe used under 50 pounds pressure or less shall be tested to 75 pounds per square inch. All pipe used under 50 pounds to 100 pounds pressure shall be tested to 150 pounds per square inch., and all pipe used under pressure exceeding 100 pounds pressure shall be tested to 225 pounds per square inch.

At such points as shall be designated by the engineer, steel trestle bents shall be erected for the support of the pipe at crossing of small water courses or marshy ground. These trestle bents will ordinarily be placed at intervals of 12 feet and will be supported upon concrete foundations of suitable dimensions. The dimensions of these bents shall conform to the plans to be furnished by the engineer, and the material of which they are constructed shall conform to the standard specifications for structural steel for bridges adopted by the American Society for Testing Materials, and shall be subject to the tests therein provided.—*Engineering-Contracting.*

THE LIFTING MAGNET IN WRECKING AND SALVAGE OPERATIONS.

Another useful application of the lifting magnet has been found in recovering submerged material. It is now being used to raise steel cargoes from vessels sunk in the Mississippi river. The present experiment is being made near New Orleans, where a barge load of kegged nails is being raised. A load of cotton ties, sunk near Natchez, will be next taken up, while a load of woven wire, sunk near Pittsburg, will be the third task. All are property of the United States Steel Corporation. The magnet used in the work is 3½ feet in diameter, and weighs 3,000 pounds. It is dropped into the stream, the current turned on, and five or six kegs of nails raised to the lift. A derrick is employed for the purpose. The nails weigh 200 pounds to the keg, so the magnet lifts from 1,000 to 1,200 pounds each operation. A great saving is being realized by the use of the magnet, which could not be otherwise effected. Were a dredge used, kegs would be broken open, and much valuable material lost. In this way, the kegs are raised intact, and the nails are uninjured, except for slight rust. Between 85 and 95 per cent of the cargo can be raised. It is valued at $45 per ton. The kegs are raised from a depth of 70 feet. Much thought has been given to the problem of thoroughly waterproofing the lifting magnet as pointed out in the very complete article on "The Lifting Magnet as an Industrial Factor" in THE IRON TRADE REVIEW, Jan. 6, 1910, and the foregoing examples are evidence of the thoroughness with which this is accomplished in existing types.

Instances are frequent where magnetic material, either loose or boxed or crated, is submerged so as to be easily reached by a magnet though possibly at depths too great for a diver, even if the value of the salved material were high enough to justify his employment. In many other instances the combination of the two might make profitable operations which would otherwise not be undertaken, especially as the modern wrecking steamer requires the addition of nothing whatever in the way of equipment except the magnet itself to make its use possible.

C°	0	10	20	30	40	50	60	70	80	90
	F	F	F	F	F	F	F	F	F	F
−200	−328	−346	−364	−382	−400	−418	−436	−454		
−100	−148	−166	−184	−202	−220	−238	−256	−274	−292	−310
−0	+32	+14	−4	−22	−40	−58	−76	−94	−112	−130
0	32	50	68	86	104	122	140	158	76	194
100	212	230	248	266	284	302	320	338	356	374
200	392	410	428	446	464	482	500	518	536	554
300	572	590	608	626	644	662	680	698	716	734
400	752	770	788	806	824	842	860	878	896	914
500	932	950	968	986	1004	1022	1040	1058	1076	1094
600	1112	1130	1148	1166	1184	1202	1220	1238	1256	1274
700	1292	1310	1328	1346	1364	1382	1400	1418	1436	1454
800	1472	1490	1508	1526	1544	1562	1580	1598	1616	1634
900	1652	1670	1688	1706	1724	1742	1760	1778	1796	1814
1000	1832	1850	1868	1886	1904	1922	1940	1958	1976	1994
1100	2012	2030	2048	2066	2084	2102	2120	2138	2156	2174
1200	2192	2210	2228	2246	2264	2282	2300	2318	2336	2354
1300	2372	2390	2408	2426	2444	2462	2480	2498	2516	2534
1400	2552	2570	2588	2606	2624	2642	2660	2678	2696	2714
1500	2732	2750	2768	2786	2804	2822	2840	2858	2876	2894
1600	2912	2930	2948	2966	2984	3002	3020	3038	3056	3074
1700	3092	3110	3128	3146	3164	3182	3200	3218	3236	3254
1800	3272	3290	3308	3326	3344	3362	3380	3398	3416	3434
1900	3452	3470	3488	3506	3524	3542	3560	3578	3596	3614
2000	3632	3650	3668	3686	3704	3722	3740	3758	3776	3794
2100	3812	3830	3848	3866	3884	3902	3920	3938	3956	3974
2200	3992	4010	4028	4046	4064	4082	4100	4118	4136	4154
2300	4172	4190	4208	4226	4244	4262	4280	4298	4316	4334
2400	4352	4370	4388	4406	4424	4442	4460	4478	4496	4514
2500	4532	4550	4568	4586	4604	4622	4640	4658	4676	4694
2600	4712	4730	4748	4766	4784	4802	4820	4838	4856	4874
2700	4892	4910	4928	4946	4964	4982	5000	5018	5036	5054
2800	5072	5090	5108	5126	5144	5162	5180	5198	5216	5234
2900	5252	5270	5288	5306	5324	5342	5360	5378	5396	5414
3000	5432	5450	5468	5486	5504	5522	5540	5558	5576	5594
3100	5612	5630	5648	5666	5684	5702	5720	5738	5756	5774
3200	5792	5810	5828	5846	5864	5882	5900	5918	5936	5954
3300	5972	5990	6008	6026	6044	6062	6080	6098	6116	6134
3400	6152	6170	6188	6206	6224	6242	6260	6278	6296	6314
3500	6332	6350	6368	6386	6404	6422	6440	6458	6476	6494
3600	6512	6530	6548	6566	6584	6602	6620	6638	6656	6674
3700	6692	6710	6728	6746	6764	6782	6800	6818	6836	6854
3800	6872	6890	6908	6926	6944	6962	6980	6998	7016	7034
3900	7052	7070	7088	7106	7124	7142	7160	7178	7196	7214
C°	0	10	20	30	40	50	60	70	80	90

C°	F°
1	1.8
2	3.6
3	5.4
4	7.2
5	9.0
6	10.8
7	12.6
8	14.4
9	16.2
10	18.0

F°	C°
1	.56
2	1.11
3	1.67
4	2.22
5	2.78
6	3.33
7	3.89
8	4.44
9	5.00
10	5.56
11	6.11
12	6.67
13	7.22
14	7.78
15	8.33
16	8.89
17	9.44
18	10.00

EXAMPLES: 1347°C = 2444°F+12°.6F = 2456°.6F: 3367°F = 1850°C+2°.78C = 1852°.78C

WALDO TEMPERATURE CONVERSION TABLE.

TEMPERATURE CONVERSION TABLE.

The table which we present herewith through the courtesy of Dr. Leonard Waldo, consulting engineer, 49 Wall street, New York, is self-explanatory and will be found convenient and useful. The values given are accurate and not approximate merely and cover the entire range of ascertained temperatures.

THE OESTERLEIN MILLING MACHINE.

The Oesterlein Machine Co., Cincinnati, O. have redesigned their No. 25 Universal Milling Machine and the halftones herewith show the machine as now built. The principal changes in design have been made in the column, the feed box and the dividing head.

The automatic feeds are transmitted from the spindle through a roller chain to the sprocket wheel of the feed box. On the sprocket shaft rides a sliding gear on which are mounted two other gears; these gears are shifted by means of the lower lever on feed box, so as to engage in either of three gears which are secured to the intermediate shaft. On this intermediate shaft are also secured a cone of gears into any one of which an intermediate tumbler gear is engaged. From the tumbler gear shaft the power is transmitted through the universal joint to the gears on the knee through which the automatic longitudinal, cross or vertical feeds are engaged. The gears in feed box run in oil, and provision is made for readily draining and putting in clean oil. A direct reading index plate is attached to the feed box showing exact feed per revolution of spindle.

The elevating screw, which is provided with ball bearings, does not extend below the base when at its lowest point.

The universal head is designed for dividing work in any position from 10 degrees below the horizontal to 10 degrees beyond the perpendicular, is furnished with dividing mechanism for spiral cutting and has several noteworthy features. The head can be securely clamped in any position by two bolts with V blocks fitting the V on body and which are spaced so as to secure great rigidity. The dividing crank is fitted on the worm shaft thus eliminating the gearing when used for dividing.

For direct indexing a half turn of the engaging crank disengages worm from wheel. The quick spacing device, for dividing work into 2, 3, 4, 6, 8, 12 and 24 divisions, consists of 24 holes drilled in the worm wheel and the front shoulder of spindle has 24 graduations in plain view, which graduations are in line with holes in worm wheel. The spindle spacer pin is hardened and the point is tapered; it is actuated by the crank shown over the spindle on the front of the head in Fig. 1.

The worm shaft and worm are made in one piece, of tool steel, and the worm wheel is bronze. To compensate for any wear that takes place between worm and worm wheel there is provided an eccentric bush which raises the engaging

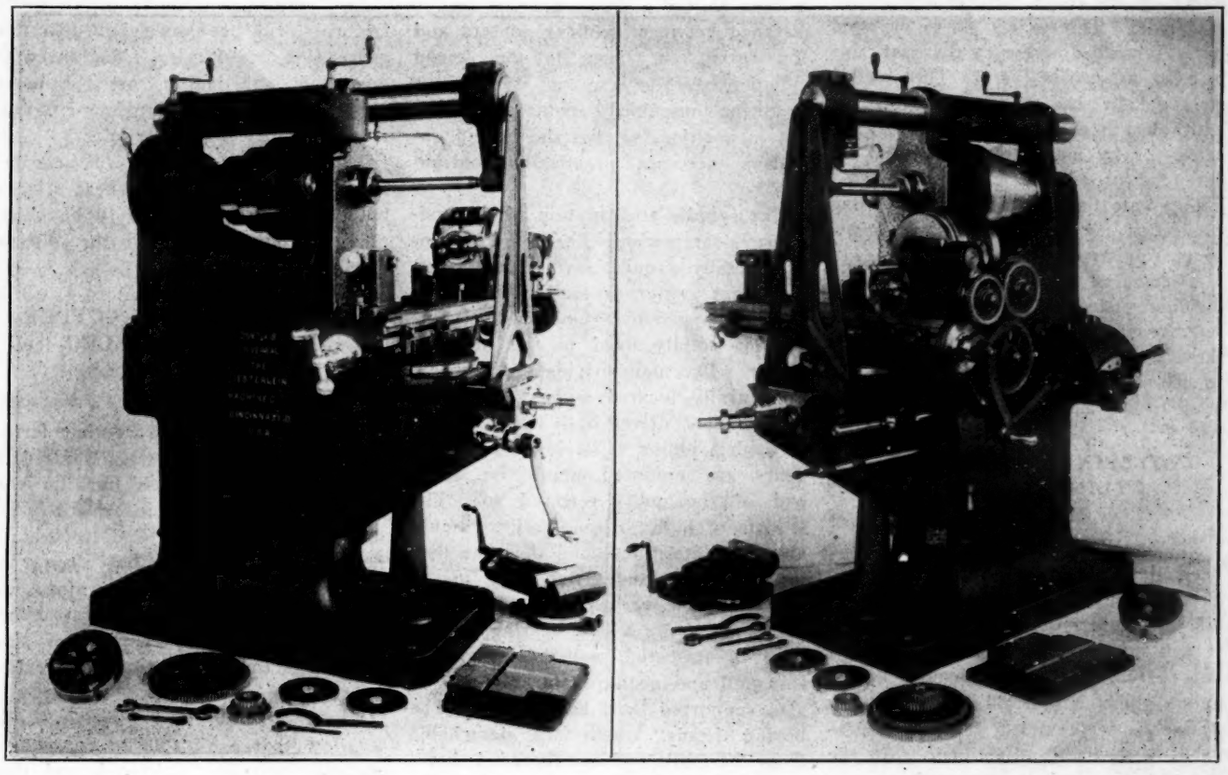


FIG. 1. THE OESTERLEIN MILLING MACHINE. FIG. 2.

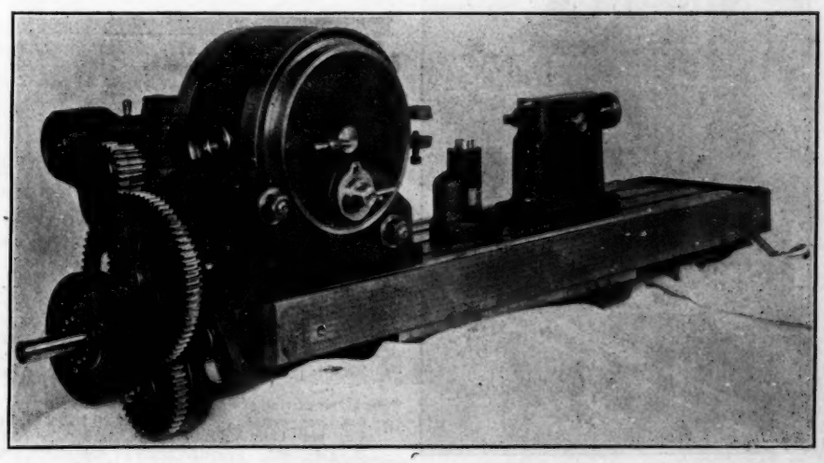


FIG. 3—REAR VIEW OF HEAD SHOWING GEARS FOR SPIRAL MILLING.

crank and consequently the worm. When using the universal head for dividing work the sleeve and plate are held stationary by locking the sleeve to trunnion.

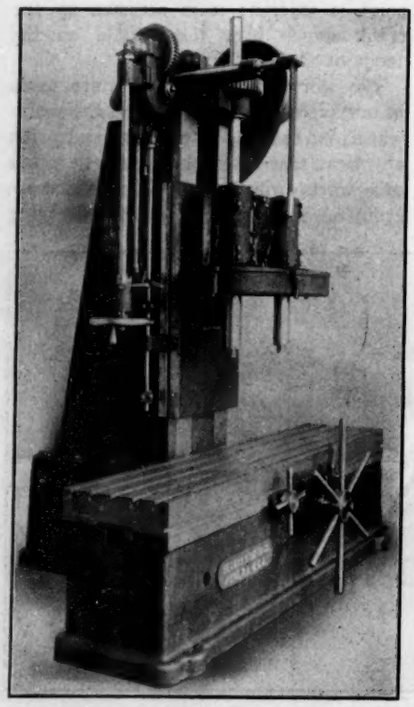
The spindle is effectually clamped by a wedge pin with a 60-degree angle milled on one end to fit a groove turned in spindle. This wedge pin is operated by a T-handled screw at the rear side of head, as seen in Fig. 3. The crucible steel spindle has a taper bearing its entire length and any wear is compensated for by means of a split nut on rear end of spindle.

To rotate the work for spiral cutting connection is made to the lead screw by gearing as shown in Fig. 3.

A complete set of change gears, 3 dividing plates, a tailstock and center rest are provided with the head. These three plates will index all divisions up to 100, all even and those divisible by 5 up to 200 and many others.

TWO-SPINDLE AUTOMOBLE CYLINDER BORING MACHINE.

The machine illustrated herewith has been designed by Beaman & Smith, Providence, R. I., for boring automobile cylinders either singly or in pairs. It will be seen that the machine consists essentially of a substantial bed, upon which is carried a work table 20 inches wide and 6 feet long, provided with hand adjustment. At the rear of the bed is mounted an upright with a vertically adjustable saddle carrying two boring spindles. The boring feed moves the entire saddle on the column and quick power movement for return is also provided.



THE BEAMAN & SMITH AUTOMOBILE CYLINDER BORING MACHINE.

When boring cylinders in pairs one cylinder in each of two castings is bored at the same time and the table is then shifted a distance equal to the distance between cylinder centers and the boring cut taken in the second cylinder. While one set of castings is being machined another may be put in position, so that the boring operation becomes practically continuous.

The spindle construction of this machine is interesting. The spindle proper is really a quill, revolving about a stationary center or stud, which is of liberal dimensions. One end of this stud is solidly fixed in the head or saddle. The main driving shaft, which is centrally located with reference to the spindles, drives both spindle gears through a pinion at its lower end. The gears are mounted upon the upper end of the quills referred to. The stud is of high carbon steel to secure all possible stiffness and thus the boring tools are supported close up to the cut. The vertical pressure of the cut is taken by a ball bearing on the nose of the stud and the weight of the quill and gear and boring head is also supported by a ball bearing. The boring heads, which are detachable from the quills and are threaded thereto, carry multiple tools, each independently adjustable, and the change from roughing to finishing is made by changing heads.

INDUSTRIAL EXPOSITION AT DETROIT.

Plans are under way for an industrial exhibition to be held in Detroit, under the auspices of the Board of Commerce, June 20 to July 6, to accelerate the commercial and industrial interests of that city.

It is planned that 100,000 different articles manufactured in the shops of Detroit will be on exhibition.

Not only the products of Detroit's factories will be shown but also the process of manufacture. Machinery in operation will demonstrate the most modern methods of transforming raw materials into finished articles.

The exposition grounds will be adjacent to the Detroit river where a large building is to be erected to be occupied in conjunction with the Wayne Pavilion.

THE BEHAVIOR OF COPPER-SLAGS IN THE ELECTRIC FURNACE.*

By LEWIS T. WRIGHT, San Francisco.

I have long been aware that ferruginous copper furnace-slags if fused in the electric arc will yield metallic iron containing copper, and in order to confirm this knowledge, and to obtain further information of the behavior of such slags in the high temperature and reducing conditions of the electric furnace, a number of samples of slag were fused in an experimental electric furnace.

The results obtained, given in Table I, show that a very large amount of metallic iron was produced, and that this iron carried with it practically all the copper, gold, and silver, and more than 50 per cent of the sulphur, of the original slag.

The metallic buttons formed in the electric furnace were clean, hard, but not brittle.

*Read at Pittsburg meeting March, 1910, American Institute of Mining Engineers.

TABLE I.
RESULTS OF FUSING FERRUGINOUS COPPER-SLAGS IN AN ELECTRIC FURNACE.

Experiment No.	9.	11.	12.	13.	14.	15.	16.
Slag used, grams	700	700	900	700	700	700	700
Strength of current, amperes	75	70	70	80	80	75	75
Time of fusion, hours	1.33	1.33	1.25	1.25	1.0	1.33	1.25
Weight of button, grams	186.0	213.78	218.95	216.32	162.82	166.9	153.45
Concentration, per cent	26.57	30.54	24.32	30.91	23.26	23.84	21.92
Analysis of slag used:							
Cu, per cent	0.55	0.25	0.30	0.28	0.28	0.45	0.38
SiO_2, per cent	36.8	39.1	39.2	39.6	39.6	45.38	38.48
Fe, per cent	42.3	38.8	38.8	40.1	40.1	40.3	38.3
S, per cent	.....	.....	.....	.....	.....	1.7	1.47
Ag, ounces per ton	0.29	0.3	0.27	0.29	0.29	0.33	0.18
Au, dollars per ton	0.40	0.30	0.30	0.30	0.30	0.30	0.15
Analysis of iron button:							
Cu, per cent	1.62	0.84	1.09	0.82	1.4	1.36	1.62
SiO_2, per cent	0.06	0.46	0.12	0.48	0.6	0.5	0.2
Fe, per cent	90.91	92.7	94.52	88.0	91.06	94.39	94.28
S, per cent	4.4	2.25	3.96	1.86	2.9	3.91	3.9
Ag, ounces per ton	1.4	0.63	0.62	1.11	0.69	0.58	0.48
Au, dollars per ton	0.80	0.40	0.40	0.50	0.60	1.20	0.80
Analysis of slag after fusion:							
Cu, per cent	0.1	0.05	0.05	0.05	0.05	trace	trace
Fe, per cent	18.8	6.5	4.9	5.0	6.3	19.31	17.23
S, per cent	0.4	0.62	0.19	0.22	0.23	0.47	0.55
SiO_2, per cent	51.38	59.0	55.8	63.5	53.8	51.12	51.84
Ag, ounces per ton	0.025	trace	0.02	0.0075	0.025	trace	trace
Au	trace	trace	trace	trace	trace	trace	trace

THE STEEL INDUSTRY'S DEBT TO CHEMISTRY.

Arthur D. Little, engineering chemist, Boston, says in a recent paper: "One need not say that the whole art of modern steel making is under the strictest chemical control, or quote Carnegie to the effect that the steel industry has been revolutionized thereby. No industry affords a better example of the value of such control or furnishes more striking instances of the profitable utilization of wastes. The conversion of slag to cement and fertilizer, the development of 10,000 horse power from the waste gases of a single furnace, are but steps in the development which will soon make pig iron the by-product of the furnace which derives its chief revenue from the waste of yesterday. With the open-hearth furnace still utilizing less than 10 per cent of the energy of its fuel, let no chemist think the door of opportunity has closed."

EXCELLENT PERFORMANCE OF A MOTOR CAR.

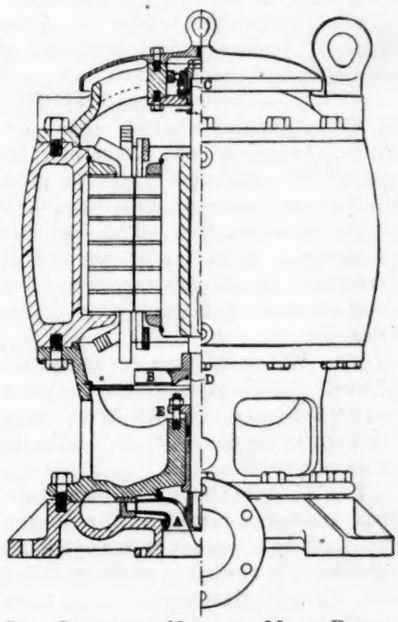
Information has been received of a notable performance recently made with a No. 16 Fairbanks-Morse motor car on the Chicago Great Western Railroad between Oelwein and Council Bluffs, in February, taking a party of officials on a trip of inspection. The run was as follows:

	Miles.
Feb. 17, Oelwein to Clarion.....	106
Feb. 18, Clarion to Hayfield and double back to Austin	125
Feb. 19, Austin to Ft. Dodge.....	114
Feb. 20, Fort Dodge to Council Bluffs.	135

The concluding part of this trip was made in the most severe blizzard of the year, with the thermometer 12 degrees below zero and the snow drifting and piling up on the track.

A SELF-CONTAINED ELECTRIC PUMP.

A self-contained electrically driven pump which possesses some unique features of design is the subject of a British patent recently issued to A. B. Mallinson, of Prestwich, Manchester, England. The pump is of the vertical motor-driven centrifugal type, and is shown in the accompanying diagram. The motor casing and the body of the pump are rigidly connected together, and the pump wheel and the motor armature or rotor are mounted on one shaft. In the illustration, *A* is the impeller, *E* the pump gland, through which the shaft passes, the upper end of the shaft being carried in *C*, a ball bearing fitted in the top cover of the motor. This cover has openings to permit the egress of air, while a cap placed above prevents the entrance of water which may fall on the outside. The open spaces in the extension of the pump body may be covered with wire netting. A fan *B* causes a current of air to be drawn in through the lower openings over the cold body of the pump. The air is thus cooled, and then blown through the motor armature and field windings, escaping out of the top openings. The under side of the hub of the fan *B* is provided with a suitably shaped annular disk *D*, which will check and throw off any water which may issue from the pump gland.—*Electrical Review and Western Electrician.*



SELF-CONTAINED VERTICAL MOTOR-DRIVEN PUMP.

BOOK REVIEWS.

How to Make Converter Steel Castings. By Arthur Simonson. 40 6 x 9-inch pages, 35 illustrations. Cleveland. The Penton Publishing Co. 75 cents net.

This little book is compiled from a series of papers by its author published in THE FOUNDRY and in a very concise and interesting style treats the subject of making steel castings by the converter method. A small foundry with a capacity of 40 tons per week is taken as a type for discussion and in six chapters the author deals with the equipment and its arrangement, selecting and mixing sands, care and maintenance of the converter and a discussion of the product. A chapter is devoted to the laboratory and its equipment, arrangement and usefulness. Illustrations are abundant and the general treatment of the subject can hardly fail to appeal to all those who are not already entitled to rank as experts.

Blast Furnace Practice. By J. James Morgan, F. I. C., F. C. S. 46 4½ x 7-inch pages, three illustrations. Philadelphia, 1910. J. B. Lippincott Co. Supplied by THE IRON TRADE REVIEW for 75 cents net.

This work deals with blast furnace operation exclusively and not at all with construction or design. Although it is based on English practice almost exclusively and contains many terms and expressions not familiar in American practice, it will be found convenient to the operator and of value to the student. Drying blast by refrigeration and its effects on operation are not even referred to and the student is left to suppose that all pig iron is sand cast. However, there is a considerable amount of useful information contained within the available space limits.

NEW PUBLICATIONS.

GRAPHOSE AGE.—Booklet treating on bearing metals distributed by the Chicago Bearing Metal Co., Chicago.

REPORT ON THE OIL SHALES OF NEW BRUNSWICK AND NOVA SCOTIA AND ALSO ON THE OIL SHALE INDUSTRY OF SCOTLAND.—In two parts. Ottawa, Department of Mines.

LES ACIERS AU VANADIUM AND VANADIUM STAHL.—Booklets in French and German on vanadium alloys Distributed by Vanadium Sales Company of America, Pittsburg.

THE PAUL PUMP.—Booklet distributed by Fort Wayne Engineering & Mfg. Co., Fort Wayne, Ind.

THE THERMAL CONDUCTIVITY OF FIRE-CLAY AT HIGH TEMPERATURES, by J. K. Clement and W. L. Egy, issued as Bulletin No. 36 of the Engineering Experiment Station, University of Illinois, is a report of the results of experiments on the thermal conductivity of several commercial fireclays at high temperatures. A detailed description of the instruments and methods of high temperature measurements is included. Copies of Bulletin No. 36 may be obtained gratis on application to W. F. M. Goss, Director of the Engineering Experiment Station, University of Illinois, Urbana, Ill.

NEW CATALOGS.

CHAIN.—Something different in the line of chain catalogs is the 122-page, 8 x 11-inch sample issued by the Standard Chain Co., Pittsburg, describing the various types of chain made by the company and their uses, together with excellent illustrations of the company's plants and equipment. The illustrations are excellent and the makeup of a high order.

ELECTRICAL MATERIAL.—Bulletins 1118 and 1119 by The Fort Wayne Electrical Works, Fort Wayne, Ind., and Madison, Wis. Devoted to Type "A" transformers and direct current motors respectively. The transformers are of the constant potential type for alternating current systems and the motors are of the "Northern" design, built at the Madison works.

NEWS FROM MANY INDUSTRIES

(In order to assist the post offices in delivering letters to new concerns, it is suggested that the names of incorporators be written in the lower left hand part of every envelope addressed to such new companies.)

New Buyers:—

The following manufacturing companies have filed articles of incorporation:

The Dayton Steel Construction Co., Dayton, O.; $25,000; by Perry M. Klepinger and others.

The Sloderbeck, Scapley & Walsh Automatic Derailer Co., Monon, Ind., $25,000; by M. C. Sloderdeck, E. E. Leapley and E. F. Walsh.

The Permanent Nut & Bolt Co., Cleveland; $50,000; by Ralph D. Stephenson, Thomas S. Dunlap, William F. Abel and Millard H. Nason.

The Butler Concrete Machinery Co., Butler, Ind., $5,000. Directors: L. C. Buehrer, Fred C. Countrymen, F. W. Swantusch, T. A. Hoffman and L. C. Harding.

The Hub Machine Welding & Contracting Co., Yonkers, N. Y.; to manufacture and repair machinery, tools, etc.; $100,000; by E. A. Mathers, Yonkers, N. Y.; E. E. Smith and B. F. Lare, both of Philadelphia.

The United Equipment Co., Manhattan, New York City; steel underframes, etc., for railroads; $10,000; by Louis H. Washburn, Hamilton M. Dewes and John Harshaw, No. 2 Rector street, New York City.

The Frontier Boiler Co., Buffalo, N. Y.; manufacturing plant; $25,000; Arthur B. Douglas, 42 Beekman street, Patrick H. Murphy, 222 Elk street, and Henry A. Bittner, 168 Silkirk street, all of Buffalo, N. Y.

The Vanadium Steel Co., Manhattan, N. Y.; iron and steel products, etc.; $2,000; by Burgess A. Cruden and Lew C. Moore, both of 5 Nassau street, and Joseph Barbato, 111 Pine street, all of New York City.

The North Side Sheet Metal & Tin Plate Co., Manhattan, New York City; sheet metal and tin ware, etc.; $3,000; by Abraham Ostrow, 617 East 181st street; Joseph Landow, 4652 Park avenue; Harry Fleischmann, 521 East 145th street, all of New York City.

The Utah Boiler & Flue Co., Salt Lake City, Utah; $100,000; to take over a patent flue fastener invented by Frederick Schmitt and will manufacture that device. President, Frederick Schmidt; vice president and manager, H. L. Powell; secretary and treasurer, H. L. Schmidt. These, with A. Fred Wey and A. B. Apperson, are the directors.

New Construction:—

The Leader Iron Works, Decatur, Ill., has begun to build an office building, 40 x 80 feet, and a warehouse addition, 50 x 100 feet.

John A. Roebling's Sons Co., Trenton, N. J., has begun work on an extensive addition to its Elmer street workshop, estimated to cost $40,000.

The Wellman-Seaver-Morgan Co., 7000 Central avenue, Cleveland, has taken out a building permit for plant alterations estimated to cost $10,000.

E. J. Cochran, Sterling, Ill., will start construction work shortly on a foundry which he proposes to build on land west of the switch tracks over Wallace street.

The Walworth Run Foundry Co., Cleveland, has taken out a permit to build a foundry at 2488 West Twenty-Seventh street, at an estimated cost of $20,000.

The United States war department has granted a permit to the Iroquois Iron Co. of Chicago, to remove a pier and build a new dock at the mouth of the Calumet river.

C. M. Hurst, of Rawlins, Wyo., is in St. Louis negotiating for the purchase of a 20-acre tract for a site for a $125,000 plant for the Hurst Automatic Switch Co.

R. Herschel Mfg. Co., Peoria, Ill., advises that it intends to add to its present factory building for the production of mower knives, reaper sickles, guards, etc. No definite plans will be decided on, however, until June or July.

The Wilmington Malleable Iron Co., South Wilmington, Del., has awarded the contract for an addition to the plant, estimated to cost $50,000. The addition will be of brick and steel, on concrete foundations, 300 feet long, with wings nearly 200 feet wide.

The Griffin Wheel Co. has purchased 17 acres in the northwestern section of Salt Lake City, on which, it is announced, a plant for manufacturing car wheels will be built. Officers of the company decline to state when the building will be undertaken.

Weaver & Wittle, Lebanon, Pa., are planning to build a foundry 50 x 100 feet, of steel sheeting, in which will be installed improved foundry equipment for handling gray iron, bronze and aluminum castings to be used in the manufacture of their gasoline engines.

Plans are being drawn for a new foundry for the Sterling Foundry Co., Sterling, Ill., on which construction will be commenced April 1. It will be one story, 40 x 195 feet, with slate roof and concrete floor, except in the foundry. The estimated cost is between $12,000 and $15,000.

The Racine Iron & Wire Works is having plans drawn for a new factory on the north side of East Prospect street, Racine, Wis. It will be built of brick, three stories, 44 x 125 feet. Beside the wire works, the new plant will turn out fire extinguishers, brass and copper work, etc.

The D. T. Williams Valve Co. will begin the erection of a new plant on Hunt street, Cincinnati, about April 1. The building will be four stories, 50 x 227 feet, of concrete construction. Some new equipment will be installed in addition to that now in use and the output of the plant will be increased considerably.

The Oscar Barnett Foundry Co., Newark, N. J., has awarded a contract for the erection of its new plant, which will cost, exclusive of machinery, $70,000. The buildings will be grouped, and the total frontage will be 580 feet, the average depth of the buildings being 180 feet. All will be built of brick and steel.

The United States Cast Iron Pipe & Foundry Co. is planning to increase the capacity of its plant at Superior, Wis. New boilers are being installed to furnish power for additional machinery, and it is planned that in the summer, equipment for making water pipe will be installed. At present, culvert pipe only is being turned out.

Work has been commenced remodeling the old Stedman foundry at Helena, Mont., in which the machinery of the National Iron Works, recently formed, will be installed. The machine shop department will be conducted by Ennis Manuel and Joseph M. Gabel, while the foundry department will be in charge of Edward Grinrod.

Concrete foundations for the buildings which the Velte Foundry & Machine Co. is building near Mars, Pa., have been completed. Additional men have been added to the working force, and it is hoped that work will be started shortly on removing the machinery

from the company's present location in Lawrenceville, near Pittsburg, to the Mars location.

The American Steel Foundries is erecting an addition to the producer house at the Chester, Pa., plant, 38 x 100 feet, of steel and concrete. After the addition is completed, the old gas producer house will be rebuilt, and six new gas producers of an improved type will be installed. An addition which is being built to the core shop is nearing completion.

The Anthracite Coalette Fuel Co composed of St. Louis, Detroit and New York capitalists, has leased a large track on Talmage avenue, St. Louis, the center of the Tower Grove manufacturing center in St. Louis, and is preparing to erect a $75,000 plant for the manufacture of coalette, a new industry to be operated in the interests of smokeless fuel.

The American Iron Works Co. has begun the construction of foundations for its proposed plant at Penn City, Tex., near Houston, and it plans to have the plant in operation by April 15. It will be equipped with modern machinery, including heavy cranes. A railroad track will connect the plant with the wharves at each of the ship channels, which will also be equipped with heavy cranes.

The Moore-Jones Brass & Metal Co., St. Louis, has taken out a building permit for a one-story foundry, to be built adjoining the present foundry of the company, at 3138 North Broadway. The foundry is estimated to cost $30,000, and it will be of reinforced concrete. The officers of the company are: President and treasurer, Edward A. Moore; vice president, Henry T. Jones; secretary, John B. Strauch.

The Oklahoma Steel, Iron Wire & Fabric Co., Enid, Okla., which was recently incorporated with a capital stock of $50,000, has selected a site for its plant opposite the Frisco depot, and construction of the building has been commenced. The following officers were recently elected: President, C. H. Halt, of Denver; vice president, W. E. Richardson; secretary, E. W. Hays; treasurer, J. H. Montay; who, together with R. E. T. Messell, constitute the board of directors.

Boyd Steel Springs Co., 505 to 513 State street, Brooklyn, N. Y., whose incorporation was noted recently, advises that it has incorporated to manufacture automobile and machinery springs. It has an entirely new plant equipped with all modern machinery, its factory outfit being ample for caring for large contracts. The officers of the company are: President and treasurer, Henry B. Boyd; vice president, Archibald B. Boyd; secretary and factory manager, Charles A. Cook.

Henry Disston & Sons, Inc., Philadelphia, have nearly completed an addition to their file shop, two stories, 44 x 79 feet. The first floor will be used for the large file-cutting machines, and the second floor for the superfine file department. The old location of the superfine file department will be filled with machines for cutting the smaller sizes of regular files. The generally increasing demand for the Disston brand of files has forced the company to enlarge its facilities.

Members of the Wheeling board of trade, Wheeling, W. Va., are considering plans for a new eight-mill galvanized sheet plant to cost approximately $500,000, to be erected at Glennova in the Wheeling district. Senator N. B. Scott has announced his willingness to head a stockholders' list for a subscription of $50,000. A committee, headed by Senator Scott, recently endeavored to purchase the LaBelle plant of the American Sheet & Tin Plate Co., but the latter refused to sell its West Virginia holdings.

The Gramm-Logan Motor Car Co., Bowling Green, O., builder of commercial cars, advises respecting its proposed plant at Lima, O., that the main front building will be 428 feet long with two wings, one 250 feet long and the other 190 feet long, all to be 75 feet wide and two stories. Beside these buildings there will be a forge shop 60 x 260 feet, as well as a large power house and other necessary buildings. The plant will be so laid out that it can be extended in all directions and additional wings added, thus providing for whatever growth of business comes along. It will be thoroughly equipped in the latest and most modern manner.

M. Rumely Co., Laporte, Ind., manufacturer of machinery for plowing, threshing, etc., advises that it will construct a foundry with a daily capacity of 100 tons so arranged as to handle about 50 tons of gray iron and 50 tons of semi-steel. The ground floor will cover an area of 220 x 320 feet, and the company expects to put up another shop for the storage of sand, coke, etc., 75 x 350 feet, with a storage yard extending farther at both sides of the shop. The cupola capacity will include at present one 48-inch and two 60-inch cupolas. There will be five bays in the building, four of which are 40 feet, and one of which is 60 feet wide by 320 feet long. All of the 40-foot bays will be covered with double and single crane service, so that practically every square inch of floor space will be covered by either hand or electric crane. As the nature of the ground on which the foundry will be constructed is uncertain, the building will be placed on piles, with a reinforced concrete foundation. The walls will be of reinforced concrete, as well as the roof. Particular attention will be given to lighting the building. The total ground area to be covered by the plant will be about 230,000 square feet, with three different railway lines giving service thereto.

Charles T. Main, mill engineer and architect, Boston, has completed plans for three new buildings for the Yale & Towne Mfg. Co., Stamford, Conn. Bids asked for plans cover building No. 6, 57 feet by 57 feet, six floors, three floors reinforced concrete, three floors slow-burning mill construction, saw-tooth roof; building No. 12, 153 by 50 feet, six floors, slow-burning mill construction, all beams of wood, saw-tooth roof; building Na. 12½, 60 by 50 feet, six floors, reinforced concrete except roof of slow-burning mill construction. All these buildings have walls of brick, first floor on ground level and every floor waterproofed, tar and gravel roofs.

General Industrials:—

The Elkhart Bridge & Iron Co., Elkhart, Ind., has filed notice of issuance of $20,000 preferred stock.

The capital stock of the Dayton Grinding Wheel Co., Dayton, O., has been increased from $10,000 to $40,000.

The St. Louis Architectural Iron Co., St. Louis, re-elected these officers at the recent annual meeting: President, E. A. Simon; vice president, A. J. Schaelich; secretary and treasurer, George H. Simon.

The Ireland & Matthews Mfg. Co., Detroit, has increased its capital stock from $200,000 to $300,000, caused by the expansion of its business in manufacturing stove trimmings and plumbers' supplies, as well as by the erection of a large addition to its plant.

The Covington Machine Co., Uniontown, Pa., has closed contracts for five additional coke drawing machines, two of which will go to the Gary plant of the United States Steel Corporation, and three to the Copper Queen Consolidated Mining Co., in New Mexico.

The Unit Tablet Co., 101 East 129th street, New York City, whose incorporation was noted recently, advises that it will do no building at present,

but will utilize the excellent manufacturing facilities of the Union Bronze Co., of that city, and will manufacture nothing but Unit tablets.

L. C. Tarris, Winona, Minn., is planning to incorporate his foundry and machine shop as the Winona Foundry Co., with an authorized capital of $50,000. Mr. Tarris will be general superintendent and F. D. Brown will become identified with the office affairs of the company. The business of the Tarris plant has grown so rapidly that it was found necessary to incorporate to handle it.

The Hudson Brass Works, 2-4 Howard street, New York City, whose incorporation was recently noted, advises that it is engaging in the manufacture of all-brass fittings for the chandelier and plumber trade, as well as in the manufacture of shower baths. A little later it expects to include brass manufacturing for the automobile trade as well. It will constantly be in need of up-to-date machinery for brass turning work especially.

The Pressed Steel Car Co., Pittsburg, is testing a new 15-ton electric lifting magnet at its Woods Run plant. If these tests are satisfactory, the company expects to replace a portion of its traveling crane equipment at both Woods Run and McKees Rocks with new machinery of the magnet type. The company will also expend about $20,000 or $30,000 on new equipment for its axle-turning department.

At the annual meeting of the stockholders of the Standard Steel Works, Philadelphia, the following officers were re-elected: President and treasurer, William Burnham; vice president, A. A. Stevenson; secretary and assistant treasurer, Robert Radford; directors, John H. Converse, Alba B. Johnson, Samuel Vauclain, William L. Austin and William Burnham. The company is controlled by the Baldwin Locomotive Works.

The Iron & Steel Products Co. elected the following officers and directors at the recent annual meeting: President, Jacob M. Shenk, Lebanon, Pa.; vice president, John C. Brown, Baltimore; treasurer, John J. Caine, Philadelphia; secretary and assistant treasurer, C. M. Foster; Eli Attwood, H. J. Shenk, E. R. Chapman, C. Shenk, John Bauerschmidt, Thomas Evans and Paul B. Scarff. The offices of the company have been removed to the Real Estate Trust Building, Philadelphia.

Stockholders of the Jacobson Machine & Mfg. Co., Warren, Pa., recently elected these officers and directors: President, F. M. Knapp; vice president, E. D. Wetmore; secretary and general manager, M. J. Hammers; treasurer, C. A. Arnold, who together with U. S. Rogers, W. F. Messner and M. C. Kline constitute the board of directors. At this meeting it was decided to make extensions to the plant in order to take care of the large number of contracts made with automobile concerns in Detroit.

The Atlas Brass Co., Detroit, gray iron castings, whose incorporation was recently noted, has purchased a complete gray iron foundry and plans to make a specialty of automobile cylinders and parts as well as other gray iron work of a like character. Its equipment includes two cupolas, with a total melting capacity per hour of 14 or 15 tons. For the present, no additional building will be undertaken, nor will any further equipment be required. The company is organized with a capital of $50,000, and William Christian is secretary and manager.

The Baker Drop Forge Co., Jackson, Mich., has been incorporated with a capital stock of $65,000, the stock being largely subscribed by stockholders of the Frost Gear & Machine Co. These officers have been elected: President, W. H. Baker; vice president, M. C. Townley; secretary and treasurer, C. M. Frost; directors, W. H. Baker, M. C. Townley, W. J. Weeks, A. S. Glasgow, E. T. Frost, C. M. Frost and E. C. Weeks. The company has purchased a factory site adjoining the plant of the Frost company. Construction contracts will be let in a few days.

Contracts have been awarded by the Pittsburg Railways Co. to the Pittsburg Valve, Foundry & Construction Co. for the necessary steam pipes for the monster turbines and generators being installed at the power plant at Brunots Island. The contracts amount to about $50,000. The Railways company is expending about $600,000 at Brunots Island to increase the power plant equipment from 10,000 to 34,000 horsepower. One 3,000 and three 5,000-kilowatt 11,000-volt alternating current turbo-generators are being installed. A new building, 485 x 180 feet, is being built, and the most modern electric equipment is being installed.

The American Iron & Forging Co., Cincinnati, whose incorporation with a capital of $25,000 was noted recently, advises that heretofore it has been a partnership business. It has now been incorporated and the management of the business will continue in the hands of H. E. Roberts, vice president and general manager. The new company will continue in the general blacksmithing and machine work, undertaking a general work of this kind such as is used by railroad contractors, mining and elevator companies and building contractors. In the near future it proposes to add to its equipment additional punch and shear, drop hammer and other tools of this character. It reports that its present business is very good, and prospects very promising, having now on hand sufficient work to keep operating over time as much as its employes can stand.

Trade Notes:—

The offices of the West Penn Steel Co. have been moved from the Keystone building, Pittsburg, to Brackenridge, Pa., where the company's plant is located.

W. P. Snyder & Co., The Shenango Furnace Co., The Shenango Steamship Co. and The Shenango Steamship & Transportation Co. will remove to their new quarters, rooms 803 to 814, Henry W. Oliver building, Pittsburg, on April 1.

Walter B. Snow, publicity engineer, 170 Summer street, Boston, Mass., announces that his office facilities have been more than doubled by removal to rooms 421-25 in the same building. Also that Mr. Benjamin H. Baker, formerly of the Boston *Transcript*, and late editor of *The Navy*, and Herbert M. Wilcox, chemical engineer, have been added to his staff.

Fires:—

The plant of the Excelsior Foundry Co., Peoria, Ill., was badly damaged Mar. 10, the loss being estimated at $2,000, partially covered by insurance.

The repair shops of the Kansas City, Mexico & Orient railroad at Fairview, Okla., were badly damaged Mar. 9, the loss being estimated at $60,000.

The carpenter shop and several other shops of the Empire Steel & Iron Co., at Mt. Hope, N. J., was destroyed Mar. 7, the loss being estimated at $2,000.

No. 2 machine shop of the Schofield-Holden Machine Co., Toronto, Can., was badly damaged Mar. 6, the loss being estimated at $5,000, covered by insurance.

The plant of the Griffin Wheel Co., at Overland, Colo., near Denver, was badly damaged Mar. 8, the fire starting in the engine room. The damage is estimated at $50,000, covered by insurance.

The Rodgers Iron Mfg. Co's plant at Muskegon, Mich. was damaged March 8, the loss being estimated at $8,000, covered by insurance. The fire started in the pattern shop which was almost totally destroyed.